YAMAHA

SNOWMOBILE

# OWNER'S MANUAL

# RST90K

LIT-12628-02-39

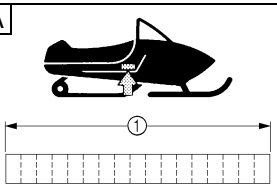
8ET-28199-10

# ⚠ WARNING

**The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.**

YAMAHA LIT-CALIF-65-01

A

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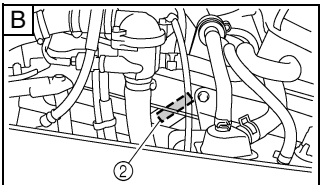


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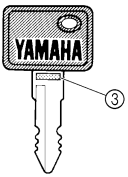


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ESU00286

# MACHINE IDENTIFICATION

## Identification number records

**A. FRAME NUMBER:**

**B. ENGINE NUMBER (PRIMARY ID):**

**C. KEY NUMBER:**

Record the frame number, engine number (Primary ID), and key number in the spaces provided for assistance when ordering spare parts from a Yamaha dealer.

① The **frame number** is the seventeen-digit number stamped on the frame of the snowmobile. (See fig. A.)
② The **engine number** is stamped in the location as shown. (See fig. B.)
③ **Key number** (See fig. C.)

Also, record and keep the ID numbers in a separate place in case the snowmobile is stolen.

ESU00011

# INTRODUCTION

Congratulations on your purchase of a Yamaha snowmobile. This model is the result of Yamaha's vast experience in the production of fine sporting and touring snowmobiles. It represents the high degree of craftsmanship and reliability that have made Yamaha a leader in these fields.

This manual will give you an understanding of the operation, inspection, and basic maintenance of this snowmobile. If you have any questions concerning the operation or maintenance of your snowmobile, please consult a Yamaha dealer.

To maintain the high quality and performance of this snowmobile, it is important that you and your Yamaha dealer pay close attention to the recommended maintenance schedules and operating instructions contained within this manual.

**RST90K**
**OWNER'S MANUAL**
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**1st Edition, June 2004**
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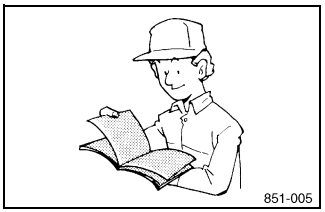
**Yamaha Motor Corporation, U.S.A.**
**is expressly prohibited.**
**Printed in Japan**
**P/N LIT-12628-02-39**




**⚠ WARNING**

**PLEASE READ AND UNDERSTAND THIS MANUAL COMPLETELY BEFORE OPERATING THE SNOWMOBILE.**

**NOTE:**

- Yamaha continually seeks advancements in product design and quality. Therefore, while this manual contains the most current product information available at the time of printing, there may be minor discrepancies between your snowmobile and this manual. If there is any question concerning this manual, please consult a Yamaha dealer.
- This manual should be considered a permanent part of this snowmobile and should remain with the snowmobile when resold.

Particularly important information is distinguished in this manual by the following notations.

⚠

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

**⚠ WARNING**

Failure to follow WARNING instructions could result in severe injury or death to the snowmobile operator, a bystander, or a person inspecting or repairing the snowmobile.

**CAUTION:**

A CAUTION indicates special precautions that must be taken to avoid damage to the snowmobile.

**NOTE:**

A NOTE provides key information to make procedures easier or clearer.

ESU00003

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# YAMAHA MOTOR CORPORATION, U.S.A.
# SNOWMOBILE LIMITED WARRANTY

Yamaha Motor Corporation, U.S.A. hereby warrants that new Yamaha snowmobiles purchased from an authorized Yamaha snowmobile dealer in the continental United States will be free from defects in material and workmanship for the period of time stated herein, subject to certain stated limitations.

**WARRANTY PERIOD:**

1. All Yamaha snowmobiles shall be warranted for a term of one (1) year from the date of purchase, plus a special early-season extension (if applicable).
2. All Yamaha snowmobile clutch components are warranted against abnormal wear for one (1) year from the date of purchase, plus a special early-season extension (if applicable).

**DURING THE PERIOD OF WARRANTY** any authorized Yamaha snowmobile dealer will, free of charge, repair or replace, at Yamaha's option, any part adjudged defective by Yamaha due to faulty workmanship or material from the factory. Parts used in warranty repairs will be warranted for the balance of the snowmobile's warranty period. All parts replaced under warranty become the property of Yamaha Motor Corporation, U.S.A.

**GENERAL EXCLUSIONS** from this warranty shall include any failures to the machine caused by:

1. Competition, racing, or non-Yamaha authorized rental use.
2. Operation on surfaces other than snow or ice.
3. Installation of parts or accessories that are not qualitatively equivalent to genuine Yamaha parts.
4. Abnormal strain, neglect, or abuse.
5. Lack of proper maintenance.
6. Accident or collision damage.
7. Modification to original parts.

**SPECIFIC EXCLUSIONS** from this warranty shall include parts replaced due to normal wear or routine maintenance including oil, spark plugs, clutch drive belts, slide runners, and track.

**THE CUSTOMER'S RESPONSIBILITY** under this warranty shall be to:

1. Operate and maintain the snowmobile as specified in the appropriate Owner's Manual.
2. Give notice to an authorized Yamaha snowmobile dealer of any and all apparent defects within ten (10) days after discovery, and make the machine available at that time for inspection and repairs at such dealer's place of business. You may locate your nearest authorized Yamaha dealer through your local telephone directory.

**WARRANTY TRANSFER:** To transfer any remaining warranty from the original purchaser to any subsequent purchaser, it is imperative that the machine be inspected and registered for warranty by an authorized Yamaha snowmobile dealer. In order for this warranty to remain in effect, this inspection and registration must take place within ten (10) days after ownership transfer. An inspection and registration fee will be charged for this service.

***YAMAHA MOTOR CORPORATION, U.S.A. MAKES NO OTHER WARRANTY OF ANY KIND, EXPRESSED OR IMPLIED. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE WHICH EXCEED THE OBLIGATIONS AND TIME LIMITS STATED IN THIS WARRANTY ARE HEREBY DISCLAIMED BY YAMAHA MOTOR CORPORATION, U.S.A. AND EXCLUDED FROM THIS WARRANTY.***

***SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE LIMITATION MAY NOT APPLY TO YOU. ALSO EXCLUDED FROM THIS WARRANTY ARE ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES INCLUDING LOSS OF USE. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE EXCLUSION MAY NOT APPLY TO YOU.***

***THIS WARRANTY GIVES YOU SPECIFIC LEGAL RIGHTS, AND YOU MAY ALSO HAVE OTHER RIGHTS WHICH VARY FROM STATE TO STATE.***

### SPECIAL EARLY-SEASON WARRANTY EXTENSION

A special warranty extension is available for all new Yamaha snowmobiles purchased between June 1 and December 1.

All new Yamaha snowmobiles purchased between June 1 and December 1 will have the warranty extended to November 30 of the following year.

**YAMAHA MOTOR CORPORATION, U.S.A.**
**Post Office Box 6555**
**Cypress, California 90630**

## WARRANTY QUESTIONS AND ANSWERS

Q. What costs are my responsibility during the warranty period?
A. The customer's responsibility includes all costs of normal maintenance services, non-warranty repairs, accident and collision damages, as well as oil, spark plugs, clutch drive belts, and slide runners.

Q. What are some examples of "abnormal" strain, neglect, or abuse?
A. These terms are general and overlap each other in areas. Specific examples include: Running the machine out of oil, hitting an object submerged under snow, operation on surfaces other than snow or ice, operating the machine with a broken or damaged part which causes another part to fail, and so on. If you have any specific questions on operation or maintenance, please contact your dealer for advice.

Q. May I perform any or all of the recommended maintenance shown in the Owner's Manual instead of having the dealer do them?
A. Yes, if you are a qualified snowmobile mechanic and follow the procedures specified in the Owner's and Service Manual. We do recommend, however, that items requiring special tools or equipment be done by a Yamaha snowmobile dealer.

Q. Under what conditions is the clutch not covered by warranty?
A. Clutches as well as clutch components wear with use. Normal wear is not covered under warranty such service is the customer's responsibility. Abnormal wear is, however, covered for one (1) year from the date of purchase. Your Yamaha snowmobile dealer possesses criteria as to what constitutes abnormal wear.

Q. Will the warranty be void or canceled if I do not operate or maintain my new Yamaha exactly as specified in the Owner's Manual?
A. No. The warranty on a new Yamaha cannot be "voided" or "canceled." However, if a particular failure is caused by operation or maintenance other than as shown in the Owner's Manual, that failure may not be covered under warranty.

Q. What responsibility does my dealer have under this warranty?
A. Each Yamaha snowmobile dealer is expected to:
1. Completely set up every new machine before sale.
2. Explain the operation, maintenance, and warranty requirements to your satisfaction at the time of sale, and upon your request at any later date.
3. In addition, each Yamaha snowmobile dealer is held responsible for his setup, service and warranty repair work.

Q. Whom should I contact if I have further questions about this warranty?
A. Your Yamaha snowmobile dealer has the information and experience necessary to answer almost any questions about this warranty. If the dealer is not able to do so, he is expected to contact Yamaha Motor Corporation, U.S.A., for clarification or assistance.

## CUSTOMER SERVICE

If your machine requires warranty service, you must take it to any authorized Yamaha snowmobile dealer within the continental United States. Be sure to bring your warranty identification card or other valid proof of the original date of purchase. If a question or problem arises regarding warranty, first contact the owner of the dealership. Since all warranty matters are handled at the dealer level, this person is in the best position to help you. If you are still not satisfied and require additional assistance, please write:

**YAMAHA MOTOR CORPORATION, U.S.A.**
**CUSTOMER RELATIONS**
**DEPARTMENT**
**P.O. Box 6555**
**Cypress, California 90630**

When contacting Yamaha Motor Corporation, U.S.A. be sure to include the model, serial number, names, dates, and receipts.

## CHANGE OF ADDRESS

The federal government requires each manufacturer of a motor vehicle to maintain a complete, up-to-date list of all first purchasers against the possibility of a safety-related defect and recall. This list is compiled from the purchase registrations sent to Yamaha Motor Corporation, U.S.A. by the selling dealer at the time of your purchase.

If you should move after you have purchased your new snowmobile, please advise us of your new address by sending a postcard listing your snowmobile model name, engine serial number, dealer number (or dealer's name) as it is shown on your warranty registration identification, your name and new mailing address. Mail to:

**YAMAHA MOTOR CORPORATION, U.S.A.**
**WARRANTY DEPARTMENT**
**P.O. Box 6555**
**Cypress, California 90630**

This will ensure that Yamaha Motor Corporation, U.S.A. has an up-to-date registration record in accordance with federal law.

ESU04280

# YAMAHA EXTENDED SERVICE (Y.E.S.)

Keep your Yamaha protected even after your warranty expires with genuine Yamaha Extended Service (Y.E.S.).

- Y.E.S. is designed and administered by Yamaha Motor Corporation to provide maximum owner satisfaction. You get uninterrupted factory-backed coverage for extra peace of mind.
- Y.E.S. is flexible. You choose the plan that's right for you: 12 months, 24 months, 36 months, or every 48 months (on selected models) beyond your warranty period.
- Y.E.S. is designed and administered by the same Yamaha people who handle your warranty—and it shows in the comprehensive coverage benefits. There are no mileage limitations, and Y.E.S. covers manufacturing defects just like the warranty. See the sample contract at your Yamaha dealer to see how comforting uninterrupted factory-backed protection can be.
- You don't have to pay anything for covered repairs. There's no deductible to pay, and repairs aren't "pro-rated." You don't have any "out-of pocket" expenses for covered repairs.
- In addition, Travel and Recreation Interruption Protection (TRIP) is included at no extra cost. TRIP gives you up to $150 reimbursement per occurrence for any reasonable expenses you incur because your Yamaha needs covered service: replacement vehicle rental, emergency towing, phone calls, even food and lodging when you are away from home. This superb coverage goes into effect when you purchase Y.E.S., so it applies to any warranty repairs as well as covered repairs during your entire Y.E.S. plan period.
- Y.E.S. coverage is honored at any authorized Yamaha dealer nationwide.
- Y.E.S. coverage is transferable to a new owner if you sell or trade-in. That can make your Yamaha much more valuable!

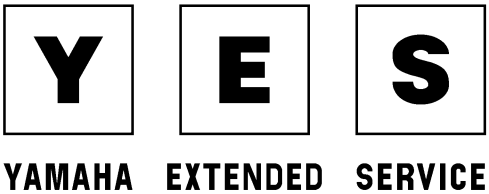
This excellent Y.E.S. plan coverage is only available to Yamaha owners like you, and only while your Yamaha is still within the Yamaha Limited Warranty period. So visit your authorized Yamaha dealer to get all the facts. He can show you how easy it is to protect your investment with Yamaha Extended Service.

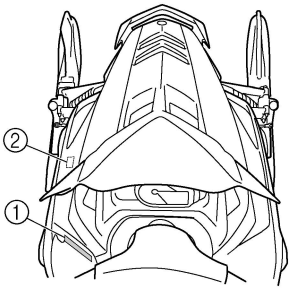
We urge you to act now. You'll get the excellent benefits of TRIP coverage right away, and you'll rest easy knowing you'll have strong factory-backed protection even after your Yamaha Limited Warranty expires. See your dealer today!

A special note:

If visiting your dealer isn't convenient, contact Yamaha toll free at 1-866-937-3983 (866 YES-EXTD) or visit our web site. All you need to do is provide your vehicle's Primary ID number (your Tunnel number). We'll be happy to help you get the Y.E.S. coverage you need.

Yamaha Service Marketing
P.O. Box 6555
Cypress, CA 90630
1-866-937-3983
www.yamaha-motor.com






ESU04050

# LOCATION OF THE IMPORTANT LABELS

Please read the following labels carefully before operating this snowmobile.

**NOTE:**

Maintain or replace safety and instruction labels, as necessary.

①

| ⚠ WARNING | ⚠ AVERTISSEMENT 8DM-E0 |
|---|---|
| SEVERE INJURY OR DEATH MAY RESULT IF YOU IGNORE ANY OF THE FOLLOWING:<br>• Read the Owner's Manual and all labels before operating this vehicle.<br>• This vehicle is a high performance machine. It should be operated by an experienced operator.<br>• Check throttle, brake, and steering for proper operation before starting engine.<br>• Set parking brake before attempting to start engine. Never run this vehicle with the parking brake applied.<br>• To stop engine in an emergency, push the engine stop switch down.<br>• Do not operate engine without drive belt or drive guard.<br>• Make sure the fuel tank cap is closed securely after refueling.<br>• Do not operate this vehicle on public roads. You could collide with another vehicle.<br>• Wear an approved helmet, eye protection, and adequate clothing for snowmobiling.<br>• Check lever position (Forward or Reverse) before moving. | AFIN D'ÉVITER TOUT RISQUE DE BLESSURE SÉRIEUSE OU MÊME MORTELLE, VEUILLEZ SUIVRE LES RECOMMANDATIONS SUIVANTES:<br>• Avant d'utiliser ce véhicule, lire le manuel du propriétaire et toutes les étiquettes.<br>• Ce véhicule est une machine à haute performance. Elle doit être conduite par un conducteur expérimenté.<br>• Avant de démarrer le moteur, vérifier l'opération du frein, de l'accélérateur et de la direction.<br>• Le frein de sécurité doit être appliqué lors du démarrage. Ne pas rouler avec le frein de sécurité actionné.<br>• En cas d'urgence, utiliser l'interrupteur d'arrêt du moteur.<br>• Ne pas laisser tourner le moteur sans la courroie ou sans son garde.<br>• S'assurer que le bouchon du réservoir soit bien refermé après le remplissage.<br>• Afin d'éviter tout risque de collision, ne pas rouler sur un chemin public.<br>• Toujours porter un casque approuvé et un habillement de motoneigiste. Prévoir une protection pour les yeux.<br>• Vérifier la position du levier (marche avant ou arrière) avant d'être en marche. |

②

| ⚠ WARNING |
|---|
| DO NOT OPERATE ENGINE WITHOUT V-BELT OR DRIVE GUARD. |
| **⚠ AVERTISSEMENT** |
| NE PAS FAIRE FONCTIONNER LE MOTEUR SANS COURROIE EN V OU PROTECTEUR D'EMBRAYAGE. |
| YAMAHA 8BD-77762-00 |

**NOTE:**

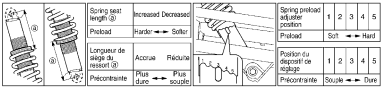
The following suspension adjustment charts are included with the Owner's Manual.

## SUSPENSION ADJUSTMENT CHART
## TABLEAU DES RÉGLAGES DE LA SUSPENSION

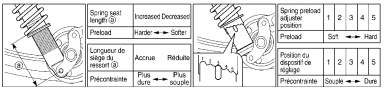
Be sure to have a Yamaha dealer make these adjustments.

Ces réglages doivent être effectués par un concessionnaire Yamaha.

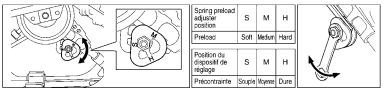
**Ski spring preload adjustment**
**Réglage de la précontrainte de ressort des skis**



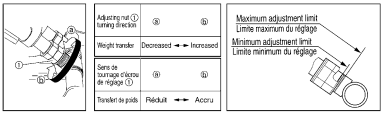

**Rear suspension spring preload adjustment**
**Réglage de la précontrainte de ressort de suspension arrière**



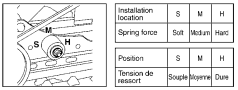

**Rear suspension torsion spring preload adjustment**
**Réglage de la précontrainte de ressort de torsion de suspension arrière**




**Control rod adjustment**
**Réglage des tiges de réglage**

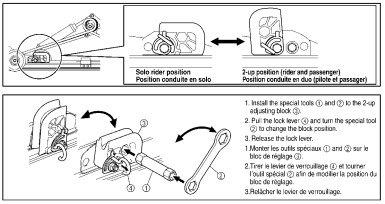



**Anti-bottoming stopper adjustment**
**Réglage des butées anti-talonnement**




**For RST90 Only :**
**2-up adjusting block positions (with/without passenger)**

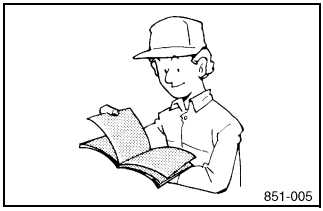
**Pour la RST90 uniquement :**
**Position des blocs de réglage (avec/sans passager)**


Solo rider position
Position conduite en solo
2-up position (rider and passenger)
Position conduite en duo (pilote et passager)
1. Install the special tools ① and ⑦ to the 2-up adjusting block ③.
2. Put the lock lever ④ and turn the special tool ② to change the block position.
3. Release the lock lever.
1. Monter les outils spéciaux ① and ② sur le bloc de réglage ③.
2. Tirer le levier de verrouillage ④ et tourner l'outil spécial ② afin de modifier la position du bloc de réglage.
3. Relâcher le levier de verrouillage.

ESU02970

# SAFETY INFORMATION

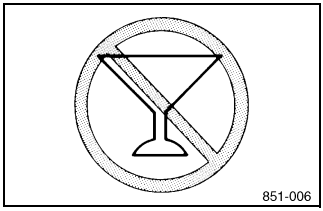
When you ride your snowmobile, you must know and use the following for your safety. Severe injury or death may result if you ignore any of the following.


851-005

**Before operating**

1. Read the Owner's Manual and all labels before operating this snowmobile. Become familiar with all of the operating controls and their function. Consult a Yamaha dealer about any control or function you do not understand.

2. This snowmobile was not manufactured for use on public streets, roads, or highways. Such use is prohibited by law, and you could collide with another vehicle.

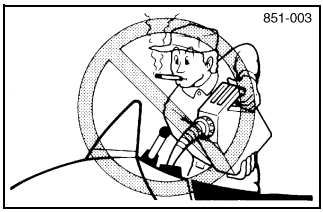

851-006

3. Do not operate the snowmobile after drinking alcohol or taking drugs. Your ability to operate the snowmobile is reduced by the influence of alcohol or drugs.

4. For safety and proper care of the snowmobile, always perform the pre-operation checks on pages 6-1–6-11 before starting the engine. Check the throttle, brake, and steering for proper operation every time before starting the engine. Make sure that the throttle lever moves freely and it returns to the home position when it is released.

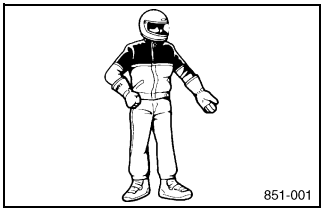
5. Apply the parking brake before starting the engine. Never drive the snowmobile with the parking brake applied. This may overheat the brake disc and reduce braking ability.

6. Do not allow anyone to stand behind the snowmobile when starting, inspecting, or adjusting the snowmobile. A broken track, track fittings, or debris thrown by the track could be dangerous to the operator or bystanders.

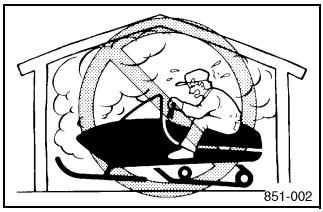



7. Handle fuel with care; it is HIGHLY FLAMMABLE.
   - Never add fuel when the engine is running or hot. Allow the engine to cool for several minutes after running.
   - Use an approved fuel container.
   - Fill the fuel tank outdoors with extreme care. Never remove the fuel cap indoors. Never fill the fuel tank indoors.
   - Never refuel while smoking or in the vicinity of an open flame.
   - Make sure that the fuel tank cap is closed securely after refueling. Wipe up any spilled fuel immediately.

8. If you swallow some gasoline, inhale a lot of gasoline vapor, or get some gasoline into your eyes, see your doctor immediately. If any gasoline spills on your skin or clothing, immediately wash your skin with soap and water, and change your clothes.




9. Wear protective clothing. Wear an approved helmet, and a face shield or goggles. Also, wear a good quality snowmobile suit, boots, and a pair of gloves or mittens that will permit use of your thumbs and fingers for operation of the controls.




**Operation**

1. Do not run the engine indoors, except when starting the engine to transport the snowmobile in or out of the building. Open the outside doors; exhaust fumes are dangerous.

2. Be careful where you ride. There may be obstacles hidden beneath the snow. Stay on established trails to minimize your exposure to hazards. Ride slowly and cautiously when you ride off of established trails. Hitting a rock or stump, or running into wires could cause an accident and injury.

3. This snowmobile is not designed for use on surfaces other than snow or ice. Use on dirt, sand, grass, rocks, or bare pavement may cause loss of control and may damage the snowmobile.

4. Avoid operating on glare ice, or on snow which has a lot of dirt or sand mixed in. Operation under such conditions will damage or result in rapid wear of ski runners, drive track, slide runners, and drive sprockets.

5. Always ride with other snowmobilers when going on a ride. You may need help if you run out of fuel, have an accident, or damage your snowmobile.

6. Many surfaces such as ice and hard-packed snow require much longer stopping distances. Be alert, plan ahead and begin decelerating early. The best braking method on most surfaces is to release the throttle and apply the brake gently—not suddenly.

**Maintenance and storage**

1. Do not leave the snowmobile on its left side for an extended period of time. Fuel may leak out from the fuel breather hose.

2. Modifications made to the snowmobile not approved by Yamaha, or the removal of original equipment may render your snowmobile unsafe for use that may cause severe personal injury. Modifications may also make the snowmobile illegal to use.

3. Never store the snowmobile with fuel in the fuel tank inside a building where ignition sources are present such as hot water and space heaters, an open flame, sparks, clothes dryers, and the like. Allow the engine to cool off before storing the snowmobile in an enclosed space.

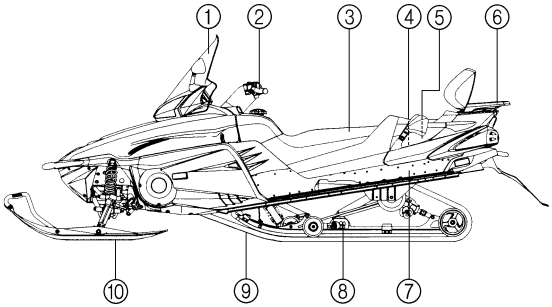
4. Always refer to the “STORAGE” section if the snowmobile is to be stored for an extended period.

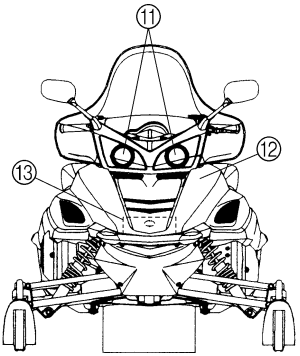
5. Maintain or replace safety and instruction labels, as necessary.

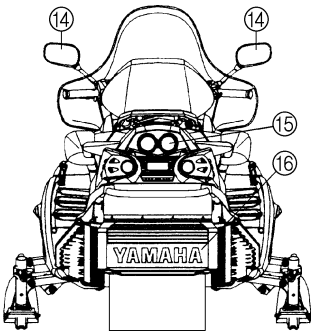
ESU00012

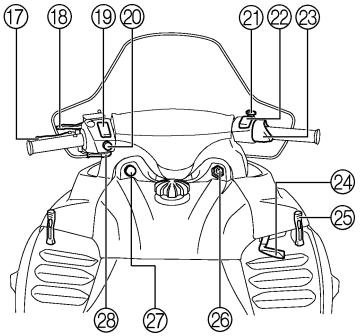
# DESCRIPTION

① Windshield
② Steering handlebar
③ Seat
④ Passenger grip warmer switch
⑤ Large solo touring storage area
⑥ Rear carrier
⑦ Frame
⑧ Slide rail suspension
⑨ Drive track
⑩ Skis
⑪ Headlights
⑫ Shroud
⑬ Storage compartment

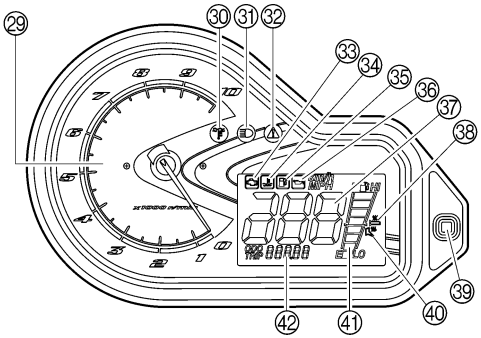





⑭ Side mirror
⑮ Tail/brake lights
⑯ Snow flap
⑰ Brake lever
⑱ Parking brake lever
⑲ Grip warmer adjustment switch
⑳ Headlight beam switch
㉑ Engine stop switch
㉒ Thumb warmer adjustment switch
㉓ Throttle lever
㉔ Shift lever
㉕ Shroud latch
㉖ Main switch
㉗ Auxiliary DC jack
㉘ Starter lever
㉙ Tachometer
㉚ Low coolant temperature indicator light
㉛ High beam indicator light
㉜ Warning light
㉝ Self-diagnosis warning indicator
㉞ Coolant temperature warning indicator
㉟ Fuel level warning indicator
㊱ Oil level warning indicator
㊲ Speedometer
㊳ Grip warmer indicator
㊴ Select/reset button
㊵ Thumb warmer indicator
㊶ Fuel meter and grip/thumb warmer level indicator
㊷ Odometer/tripmeter



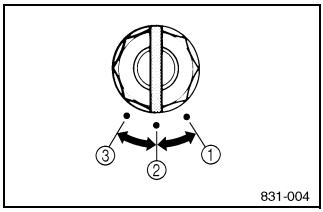
ESU00013

# CONTROL FUNCTIONS

ESU00362

## Main switch

The main switch controls the following items.




① “OFF”
The ignition circuit is switched off.
The key can be removed only in this position.

② “ON”
The ignition circuit is switched on.

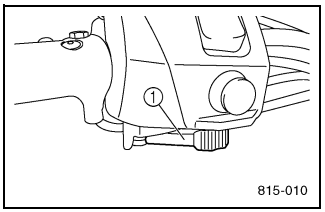
③ “START”
The starting circuit is switched on.
The starter motor starts.

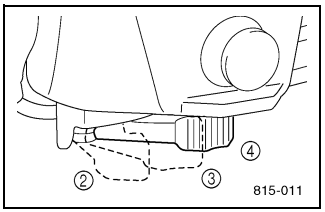
**CAUTION:**

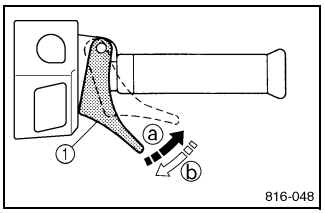
**Release the switch immediately after the engine starts.**

**NOTE:**

The headlights, meter lights, and taillights come on after the engine starts.




ESU00201

### Starter lever (choke)

Use the starter lever (choke) when starting and warming up a cold engine.

① Starter lever (choke)
② When starting a cold engine.
③ Warming up
④ When the engine is warm.

**NOTE:**

Refer the “Starting the engine” section for proper operation.

ESU00022

### Throttle lever

Once the engine is running cleanly, squeezing ⓐ the throttle lever ① will increase the engine speed and cause engagement of the drive system. Regulate the speed of the snowmobile by varying the throttle position. Because the throttle is spring-loaded, the snowmobile will decelerate, and the engine will return to idle when it is released ⓑ.

**⚠ WARNING**

**Check the throttle, brake, and steering for proper operation before starting the engine.**

ESU00361

### Engine overheating prevention system

This model is equipped with an engine overheating prevention system to prevent overheating when the engine is idling.

When the engine has been idling for at least 3 minutes and the coolant temperature has risen above 100 °C (212 °F), the engine automatically shuts off to prevent overheating.

**NOTE:**

The engine can be started after it shuts off.

ESU04151

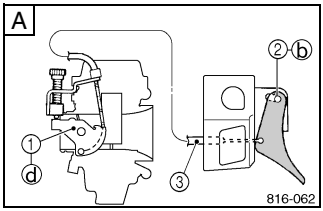
## Throttle override system (T.O.R.S.)

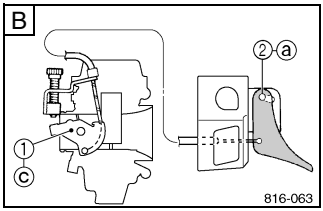
If the carburetor or throttle cable should malfunction during operation, the T.O.R.S. will operate when the throttle lever is released.

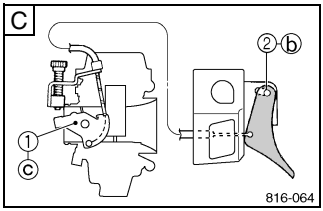
The T.O.R.S. is designed to interrupt the ignition and keep the engine speed between 2,800 and 3,000 r/min if the carburetor fails to return to idle when the lever is released.

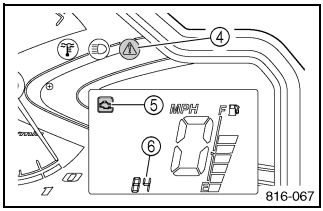
### ⚠ WARNING

- **If the T.O.R.S. is activated, make sure that the cause of the malfunction has been corrected and that the engine can be operated without a problem before restarting the engine.**
- **Be sure to use the specified spark plug and spark plug cap. Otherwise, the T.O.R.S. will not work properly.**



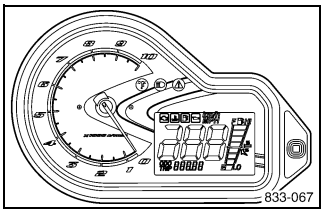




| Mode / Item | A Idling/ starting | B Running | C Trouble |
|---|---|---|---|
| Throttle switch | Off | On | Off |
| Throttle position sensor | Closed | Open | Open |
| Engine | Run | Run | T.O.R.S. will operate |

A Idling/starting
B Running
C Trouble
① Throttle position sensor (throttle valve position)
② Throttle switch
③ Throttle cable
ⓐ On
ⓑ Off
ⓒ Open
ⓓ Closed

**NOTE:**

When the T.O.R.S. is activated, the warning light ④ and self-diagnosis warning indicator ⑤ will flash and the two-digit code “84” ⑥ will flash in the tripmeter/odometer display.

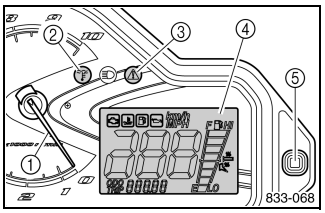



ESU04160

## Speedometer unit

The speedometer unit is equipped with the following:

- a digital speedometer (which shows riding speed)
- an odometer (which shows the total distance traveled)
- a tripmeter (which shows the distance traveled since it was last set to zero)
- warning indicators (which show self-diagnosis, coolant temperature, fuel level, and oil level warnings)
- a fuel meter (which shows the fuel remaining in the fuel tank)
- a grip/thumb warmer level indicator (which shows the grip warmer level or the thumb warmer level)




After the engine is started, the tachometer ① makes one sweep, and the low coolant temperature indicator light ②, the warning light ③, and all segments of the meter ④ turn on and off once.

The grip warmer level is initially displayed for 5 seconds, then switches to the fuel meter display.

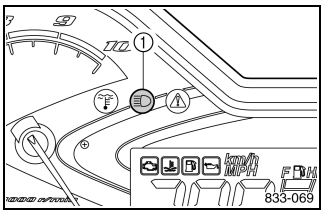
### Odometer and tripmeter modes

Pushing the select/reset button ⑤ switches the display between the odometer mode “ODO” and the tripmeter mode “TRIP”.

To reset the tripmeter, push the select/reset button for at least one second while the tripmeter is displayed.

**NOTE:**

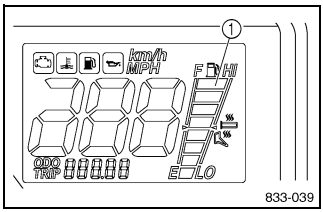
To switch the speedometer, odometer, and tripmeter displays between kilometers and miles, select the odometer mode “ODO”, and then push the select/reset button ⑤ for at least 10 seconds while the snowmobile is stopped.




ESU00363

## High beam indicator light

The high beam indicator light ① comes on when the high beams of the headlights are switched on. (See page 5-10 for headlight beam switch operation.)

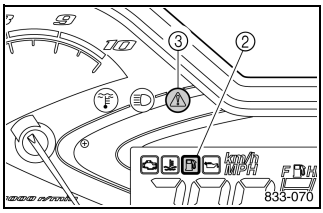


833-039

ESU03821

## Fuel meter and grip/thumb warmer level indicator

The fuel meter and grip/thumb warmer level indicator have eight segments ① which show the amount of fuel remaining in the fuel tank, the grip warmer level, or the thumb warmer level.



833-070

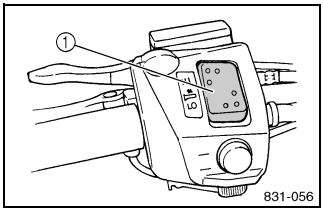
### Fuel meter

As the fuel level decreases in the fuel tank, the segments disappear until the level goes down to the last segment “E” (Empty). When this occurs, the fuel level warning indicator ② and the warning light ③ come on.

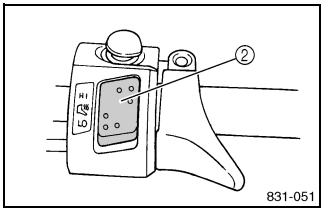
If the fuel level warning indicator and the warning light come on, fill the fuel tank at the first opportunity.

**NOTE:**

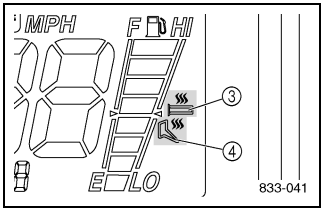
The snowmobile must be stopped on a level surface to obtain an accurate fuel meter reading. The fuel meter reading changes as the snowmobile moves and depending on the inclination of the snowmobile.



831-056



831-051



833-041

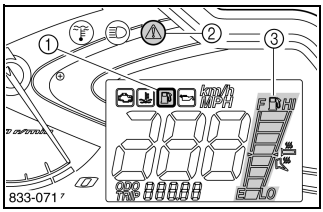
### Grip/thumb warmer level indicator

The grip warmer adjustment switch ① and the thumb warmer adjustment switch ② control the electrically heated handlebar grips and throttle lever respectively.

To raise the temperature, press each switch to “HI”. To lower the temperature, press each switch to “LO”.

**NOTE:**

- The grip warmer indicator ③ comes on and the display switches to the grip warmer level when the grip warmer adjustment switch is pressed.
- The thumb warmer indicator ④ comes on and the display switches to the thumb warmer level when the thumb warmer adjustment switch is pressed.
- The grip/thumb warmer level is displayed for 5 seconds after releasing the grip/thumb warmer adjustment switch, then switches to the fuel meter.
- The top segment of the grip/thumb warmer level indicator flashes once if the grip/thumb warmer adjustment switch is continually pressed at the maximum level. The bottom segment of the grip/thumb warmer level indicator flashes once if the grip/thumb warmer adjustment switch is continually pressed at the minimum level.
- When the engine is started, the grip/thumb warmer levels are set to the levels saved when the engine was stopped.



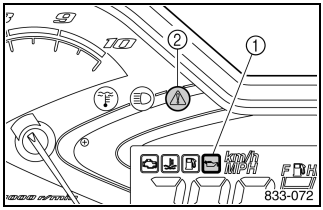

ESU04260

## Fuel level warning indicator

The fuel level warning indicator indicates a malfunctioning sensor, disconnected coupler, broken lead, or short circuit when detected by the self-diagnosis device of the snowmobile.

The fuel level warning indicator ①, warning light ②, and all segments of the fuel meter ③ warn the rider of the above problems by flashing continuously.

When this occurs, have a Yamaha dealer inspect the snowmobile as soon as possible.




ESU00377

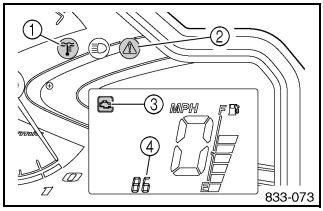
## Oil level warning indicator

The oil level warning indicator ① and the warning light ② come on when the engine oil level is low.

If the oil level warning indicator and the warning light come on, place the snowmobile on a level surface and allow it to idle for one minute.

If the oil level warning indicator and the warning light go off, the engine oil level is sufficient, however it is getting low. Add engine oil as soon as possible.

If the oil level warning indicator and the warning light do not go off, check the engine oil level in the oil tank (see page 6-3), and add engine oil if necessary.




ESU04171

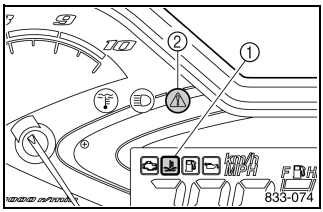
## Low coolant temperature indicator light

The low coolant temperature indicator light ① comes on when the coolant temperature is low and informs the rider that the snowmobile must be warmed up. After the engine is started, warm it up until the indicator light goes off.

The snowmobile can be operated normally after the indicator light goes off.

**NOTE:**

Operate the snowmobile at low speeds when the low coolant temperature indicator light is on. If the engine speed is too high, the warning light ② and self-diagnosis warning indicator ③ will flash and the two-digit code "86" ④ will flash slowly in the tripmeter/odometer display. When this occurs, the engine control system prevents the engine speed from rising.



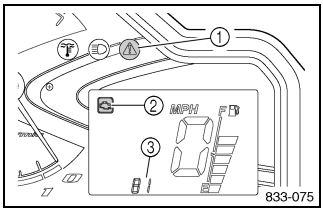

ESU04180

### Coolant temperature warning indicator

If the engine overheats, the coolant temperature warning indicator ① and the warning light ② come on. When this occurs, stop the engine immediately and allow the engine to cool down, and then check the coolant level in the coolant reservoir. (See page 6-4.)

**CAUTION:**

**Do not operate the engine if it overheats.**




ESU04251

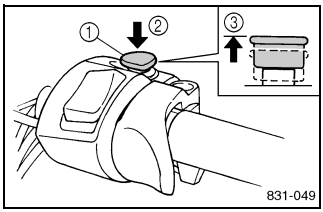
### Self-diagnostic system

This model is equipped with a self-diagnostic system for various electrical circuits.

If any of those circuits are defective, the warning light ① and the self-diagnosis warning indicator ② will flash, and then an error code (e.g., Er_1, Er_2, 16, 81) ③ will flash slowly in the tripmeter/odometer display.

**⚠ WARNING**

- **If the self-diagnosis warning indicator and warning light flash continuously, and an error code is displayed during operation, there may be some problem with the electrical circuit, lead couplers, etc.**
- **Stop the engine and allow it to cool off. Then, check that the wire harness couplers in the engine compartment are connected properly.**
- **If the self-diagnosis warning indicator, warning light, and an error code flash after the engine has been restarted, note the error code, and then have a Yamaha dealer inspect the snowmobile as soon as possible.**

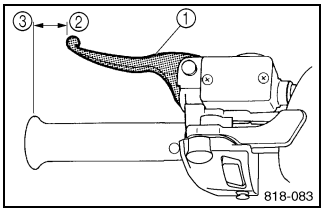



ESU00031

## Engine stop switch

The engine stop switch ① is used to stop the engine in an emergency. Simply push ② the stop switch to stop the engine. To start the engine, pull ③ the stop switch and proceed with starting the engine. (See page 7-1 for more details.)

During the first few rides, practice using the stop switch so that you can react quickly in an emergency.




ESU00320

## Brake lever

The snowmobile is stopped by braking the entire drive system.

Squeeze the brake lever towards the handlebar grip to stop the snowmobile.

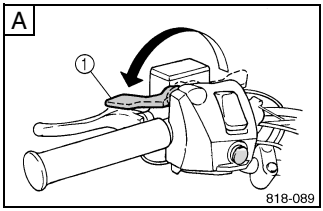
① Brake lever
② Brake lever end
③ Handlebar end

**NOTE:**

When the brake lever is operated, the brake light will illuminate.

**CAUTION:**

**Make sure that the brake lever end does not project out over the handlebar end. This will help prevent brake lever damage when the snowmobile is placed on its side for service.**

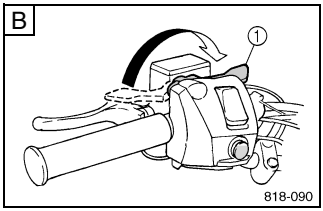



ESU00035

## Parking brake lever

When parking the snowmobile or starting the engine, apply the parking brake by moving the brake lever ① to the left.

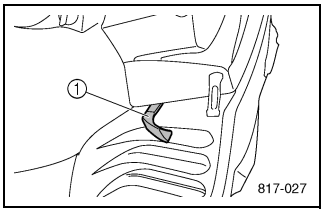
To release the parking brake, move the parking brake lever ① to the right.




A To apply the parking brake
B To release the parking brake

**⚠ WARNING**

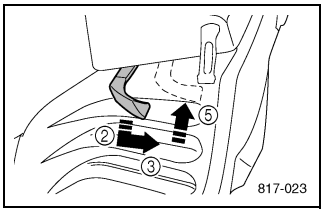
- **Always set the parking brake before attempting to start the engine.**
- **Never run the snowmobile with the parking brake applied. This may overheat the brake disc and reduce braking ability.**



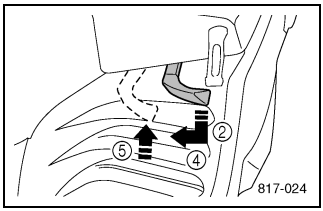

ESU00341

## Shift lever

The shift lever is used to put the snowmobile into forward or reverse. After coming to a complete stop, pull the shift lever out, slide it to “FWD” or to “REV” until it stops, and then release it.

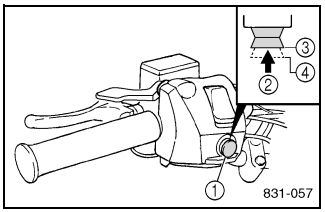



① Shift lever
② Pull out
③ Slide to “FWD” (Forward)
④ Slide to “REV” (Reverse)
⑤ Release




**CAUTION:**

**Do not shift from “FWD” to “REV” or from “REV” to “FWD” while the snowmobile is moving. Otherwise, the drive system could be damaged.**




ESU00039

### Headlight beam switch

Push the headlight beam switch to change the headlight beam to high or low.

① Headlight beam switch
② Push
③ High beam
④ Low beam

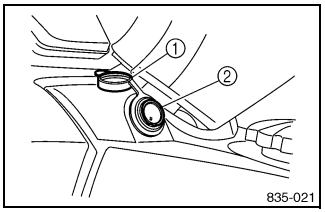
ESU04300

### Auxiliary DC jack

The auxiliary DC jack is located in the front panel and can be used for accessories.

**NOTE:**

The auxiliary DC jack cannot be used if the engine is not running.




1. Start the engine.
2. Open the auxiliary DC jack cap ①, and then insert the accessory power plug into the jack ②.

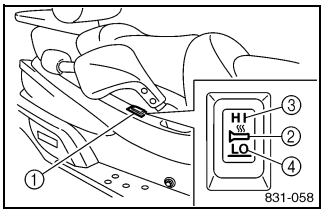
**NOTE:**

After using the auxiliary DC jack, be sure to remove the accessory power plug from the jack and close the auxiliary DC jack cap.

**CAUTION:**

- **Do not use accessories requiring more than the maximum rated capacity for the auxiliary DC jack. This may overload the circuit and cause the fuse to blow. (See pages 8-31 – 8-32 for the specified amperage.)**
- **Do not use an automotive cigarette lighter or other accessory with a plug that gets hot because the jack can be damaged.**

Maximum rated capacity:
DC 12 V, 2.5 A (30 W)




ESU04290

### Passenger grip warmer switch

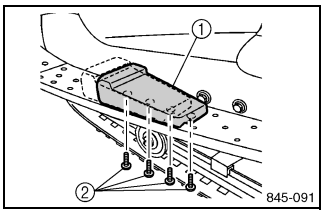
The passenger grip warmer switch controls the electrically heated passenger grips.

① Passenger grip warmer switch
② Off
③ “HI” High
④ “LO” Low

ESU04311

### Footrests

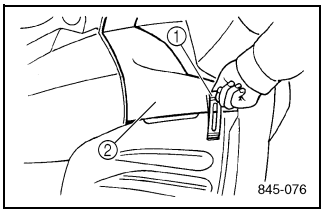
The footrests can be installed in two locations to suit passenger preference.
To change the location of a footrest, remove the screws, place the footrest in the desired location, and then install and tighten the screws.




① Footrest
② Screws

**CAUTION:**

**Make sure that the footrest screws are tightened securely after changing the installation location of the footrests.**




ESU00481

### Shroud latches

To open the shroud, unhook the shroud latches, and then slowly raise the shroud forward until it stops. When closing the shroud, slowly lower it to its home position, and then hook the shroud latches.

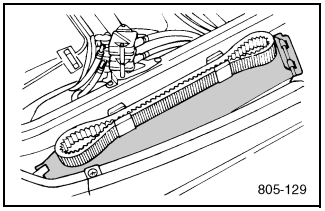
① Shroud latch
② Shroud

**CAUTION:**

**Make sure that all cables and wires are in place when closing the shroud.**

**⚠ WARNING**

- **Do not drive the snowmobile with the shroud open, unlatched, or removed.**
- **Keep your body and clothing away from rotating parts when servicing with the shroud open.**
- **Do not touch the hot muffler and engine during or immediately after operation.**



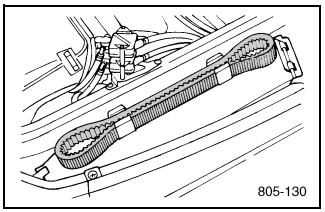

ESU00521

### Drive guard

The drive guard is designed to cover the V-belt clutch and V-belt in case parts break or come loose.

**⚠ WARNING**

- **Make sure that the drive guard is tightened securely before operating the snowmobile.**
- **Never run the engine with the V-belt or drive guard removed.**




ESU00053

## V-belt holders

Keep a spare V-belt for emergency use by placing it into the V-belt holders provided.

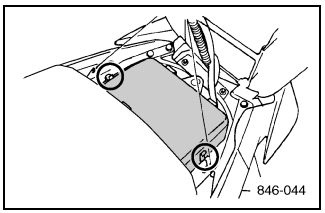
**CAUTION:**

**Make sure that the V-belt is installed securely in the holders.**

ESU04322

## Storage areas

This snowmobile is equipped with a storage compartment, rear storage area, and rear carrier.



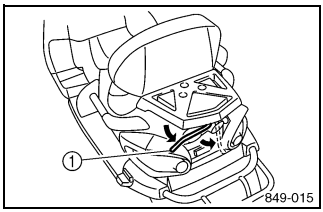

### Storage compartment

The storage compartment is located under the shroud.
Open the storage compartment to store the tool kit, spare parts, or other small items.

### Rear storage area and rear carrier

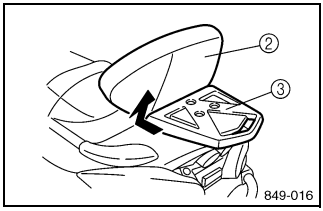
The rear storage area and the rear carrier are located at the rear of the snowmobile.
The rear storage area can be used when the passenger seat is removed.

Maximum load limit:
- Rear storage area:
  - 20 kg (44 lb)
- Rear carrier:
  - 10 kg (22 lb)

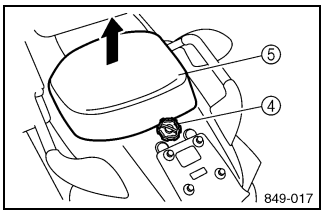



**To remove the passenger seat, backrest, and rear carrier**

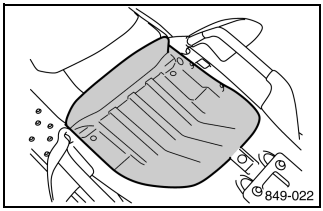
1. Pull the carrier lock lever ① away from the carrier lock bracket, and then push it down to unlock the backrest ② and the rear carrier ③.




2. Slide both the backrest and the rear carrier forward until they stop, and then remove them.

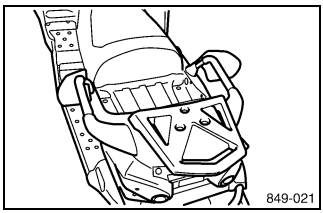



3. Remove the passenger seat lock knob ④, and then remove the passenger seat ⑤.




**CAUTION:**

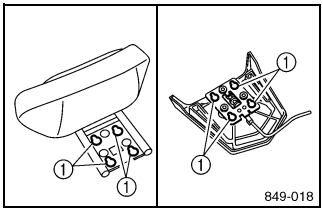
**When using the rear storage area, do not load any cargo that is too large for it. In addition, cargo must not project from the edges of the rear storage area.**



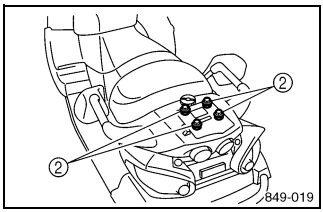

**To install the passenger seat, backrest, and rear carrier**

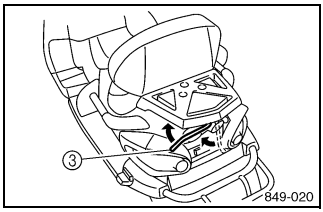
**NOTE:**

If loading cargo on both the rear storage area and the rear carrier, follow steps 3–5 to install the rear carrier without installing the passenger seat and backrest.




1. Install the passenger seat, and then install the passenger seat lock knob.
2. Align the holes ① in the backrest bracket with the bolts ② on the carrier lock bracket, and then place the backrest on the carrier lock bracket.
3. Align the holes in the rear carrier with the bolts on the carrier lock bracket, and then place the rear carrier on the carrier lock bracket.
4. Slide both the backrest and the rear carrier backward until they stop.




5. Pull the carrier lock lever ③ up to lock the backrest and the rear carrier in place. Then, place the lever under the rear carrier and secure it with the holder.

ESU00072

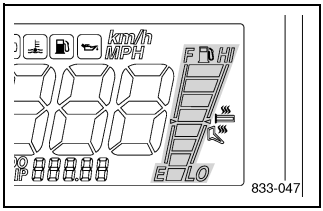
# PRE-OPERATION CHECKS

**NOTE:**

Pre-operation checks should be made each time the snowmobile is used.

## ⚠ WARNING

**The engine and muffler will be very hot after the engine has been run.**
**Avoid touching the engine and muffler while they are still hot with any part of your body or clothing during inspection or repair.**



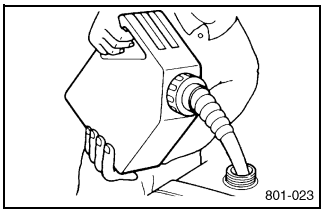
833-047

ESU00075

### Fuel

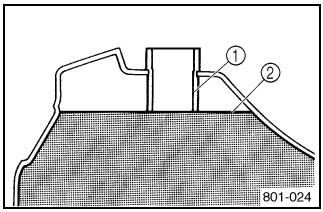
Make sure that there is sufficient fuel in the fuel tank.

Recommended fuel:
Unleaded gasoline
Pump octane $\frac{R+M}{2}$ ; 88 or higher
Fuel tank capacity:
38.0 L (8.4 Imp gal, 10.0 US gal)


801-023

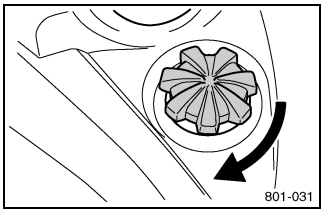
## ⚠ WARNING

- **Fuel is HIGHLY FLAMMABLE and poisonous. Check the "SAFETY INFORMATION" section carefully before refueling. (See page 3-2.)**
- **Do not fill the fuel tank above the bottom of the filler tube ①. Fuel could overflow if the snowmobile is tilted on its side or if the ambient temperature rises, causing the fuel to warm up and expand.**
- **Make sure that the fuel tank cap is closed securely after refueling. Leaking fuel can catch fire.**



801-024

② Fuel level


801-031

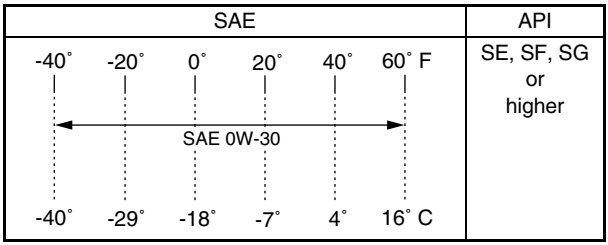
**CAUTION:**

- **Oxygenated fuels (gasohol) containing a maximum 5% of ethanol can be used, although richer jetting may be required to prevent engine damage. Consult a Yamaha dealer. Gasohol containing methanol is not recommended.**
- **Make sure that snow or ice does not enter the fuel tank when refueling.**
- **Do not use alcohol deicers or water absorbing additives with oxygenated fuel.**
- **The fuel tank should be filled with straight gasoline as specified.**

ESU04030

### Engine oil

Use a combination of the recommended SAE and API oil classifications shown in the chart below.




**CAUTION:**

- **Use only 4-stroke engine oil.**
- **Engine oil also lubricates the starter clutch. In order to prevent clutch slippage, do not mix any chemical additives with the oil or use oils of a higher grade than "CD". In addition, do not use oils labeled "ENERGY CONSERVING II" or higher.**

ESU03441

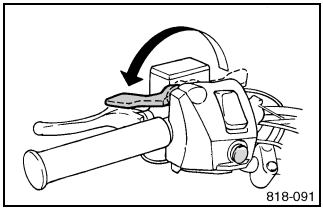
## Engine oil level

The engine oil level should be checked before each use.

**CAUTION:**

**Do not run the engine with too much or not enough oil in the oil tank. Oil could flow into the air filter case and the engine could be damaged.**

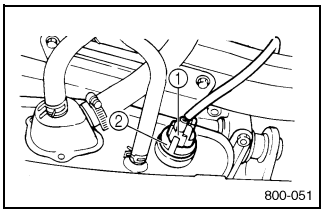
**Checking the engine oil level**


818-091

1. Place the snowmobile on a level surface and apply the parking brake.
2. Start the engine, warm it up for 10–15 minutes, and then turn it off.

**NOTE:**

- The engine can also be warmed up by operating the snowmobile for 10–15 minutes.
- After operating the snowmobile, allow the engine to idle for at least 10 seconds before turning it off.

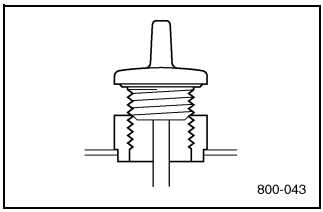


800-051

3. Disconnect the oil level gauge coupler ①.

**CAUTION:**

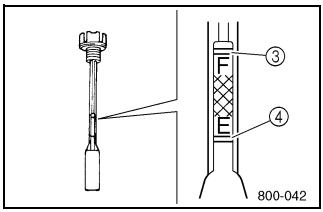
**Disconnect the oil level gauge coupler before removing the oil level gauge/dipstick. Otherwise, the cable can twist and break.**


800-043

4. Remove the oil level gauge/dipstick ②, wipe it clean, insert it back into the filler hole (without screwing it in), and then remove it again to check the oil level.

**NOTE:**

The engine oil should be between the "F" ③ and "E" ④ level marks on the oil level gauge/dipstick.



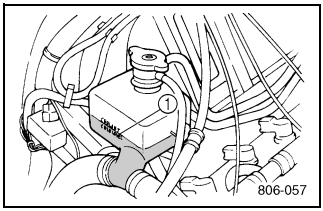
800-042

5. If the engine oil is below the "E" level mark, add sufficient oil of the recommended type to raise it to the "F" level mark. (See page 6-2 for the recommended oil.)

**CAUTION:**

- **When adding the engine oil, be careful not to fill above the "F" level mark on the oil level gauge/dipstick.**
- **Make sure that no foreign material enters the engine oil tank.**

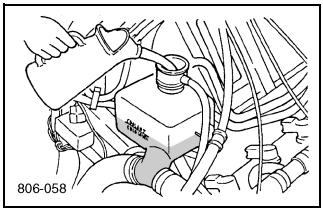
6. Insert the oil level gauge/dipstick into the oil filler hole, and then tighten it securely.
7. Connect the oil level gauge coupler.




ESU00086

## Coolant

Check the coolant level in the coolant reservoir when the engine is cold. If the coolant level is below the "COLD LEVEL" mark, add soft water until it reaches the "COLD LEVEL" mark. (See pages 8-13–8-14 for more details.)



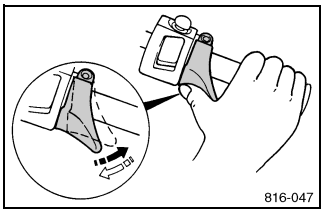

① "COLD LEVEL" mark

**⚠ WARNING**

**Do not remove the coolant reservoir cap when the engine is hot.**

**CAUTION:**

- **Hard water or salt water is harmful to the engine parts. You may use boiled or distilled water, if soft water is not available.**
- **Tap water can be used temporarily in an emergency.**




ESU00087

### Throttle lever

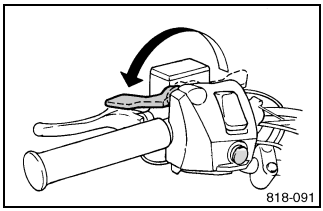
Check the throttle lever operation before starting the engine.

The throttle lever must open smoothly and spring back to its home position when released.

ESU00090

### Throttle override system (T.O.R.S.)

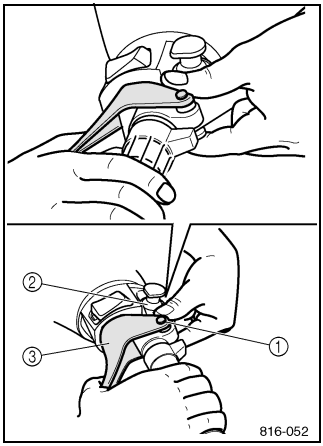
Check the T.O.R.S. for proper operation.




**⚠ WARNING**

**When checking T.O.R.S.:**

- **Make sure that the parking brake is applied.**
- **Make sure that the throttle lever moves smoothly.**
- **Do not run the engine up to clutch engagement r/min. Otherwise, the snowmobile could start moving forward unexpectedly, which could cause an accident.**




1. Start the engine.

**NOTE:**

Refer to the “Starting the engine” section.

2. Hold the pivot point of the throttle lever away from the throttle switch by putting your thumb (above) and forefinger (below) between the throttle lever pivot ① and the engine stop switch housing ②.
   While holding the pivot point as described above, press the throttle lever ③ gradually.
   The T.O.R.S. will operate and the engine should run between 2,800 and 3,000 r/min.

**⚠ WARNING**

**If the engine does not run between 2,800 and 3,000 r/min, stop the engine by turning the main switch to the “OFF” position and consult a Yamaha dealer.**

ESU00091

## Brake

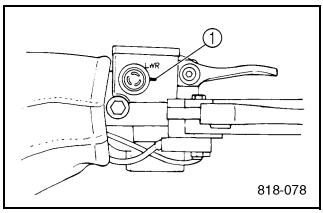
1. Brake lever
   Test the brake at a low speed when starting out to make sure that it is working properly. If the brake does not provide proper braking performance, inspect the brake for wear or brake fluid leakage. (See pages 8-19–8-20 for more details.)

**⚠ WARNING**

- **A soft, spongy feeling in the brake lever indicates a failure in the brake system.**
- **Do not operate the snowmobile if you find any problems in the brake system. You could lose braking ability, which could lead to an accident. Ask a Yamaha dealer to inspect and repair the brake system.**

**CAUTION:**

**Make sure that the brake lever end does not project out over the handlebar end. This is to prevent brake lever damage when the snowmobile is placed on its side.**




2. Brake fluid
   Check the brake fluid level. (See page 8-20.)
   Add fluid if necessary.

① Lower level

| Specified brake fluid: DOT 4 |
|---|

ESU00093

### Brake fluid leakage

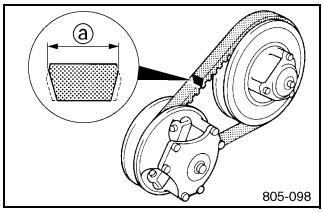
Apply the brake for a few minutes. Check to see if any brake fluid leaks out from the brake hose joints or the master cylinder.

**⚠ WARNING**

**If brake fluid leakage is found, ask a Yamaha dealer for immediate repairs.**

**CAUTION:**

**Brake fluid may deteriorate painted surfaces or plastic parts. Never spill any brake fluid. If any is spilled, clean it up immediately.**




ESU00941

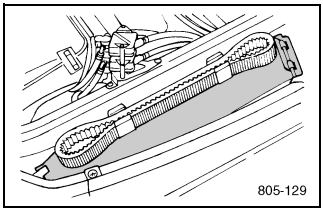
### V-belt

Open the shroud and remove the drive guard.
Check the V-belt for wear and damage. Replace if necessary.

| Wear limit ⓐ: 32.5 mm (1.28 in) |
|---|

**⚠ WARNING**

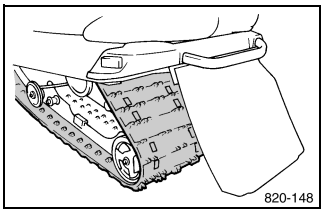
- **Make sure that the drive guard is tightened securely before operating the snowmobile.**
- **Never run the engine without the V-belt or with the drive guard removed.**




ESU00096

### Drive guard

Check the drive guard mounts for damage. Make sure that the drive guard is firmly in place.



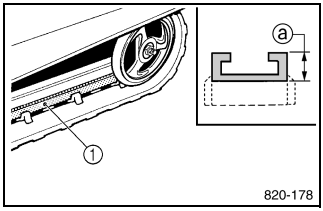

ESU00097

## Drive track

Check the drive track for deflection, wear, or damage. Adjust or replace if necessary. (See pages 8-29–8-31 for more details.)

**⚠ WARNING**

**Do not operate the snowmobile if you find damage to the drive track, or if it has been maladjusted. Drive track damage or failure could result in loss of braking ability and snowmobile control, which could cause an accident.**




ESU00982

## Slide runners

Check the slide runners for wear and damage.

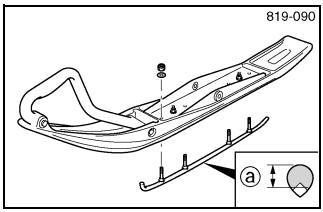
If the slide runners reach the wear limit, they should be replaced.

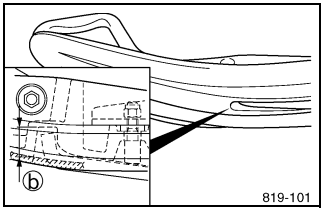
① Slide runners
ⓐ Wear limit

| Wear limit height: |
| --- |
| 10.5 mm (0.41 in) |

**CAUTION:**

**Ride on fresh snow frequently. Operating on ice or hard packed snow will rapidly wear the slide runners.**




ESU01020

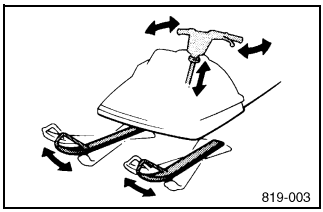
## Skis and ski runners

Check the skis and ski runners for wear and damage. Replace if necessary.

| |
|---|
| Ski runner wear limit ⓐ:<br>8 mm (0.31 in)<br>Ski wear limit ⓑ:<br>24 mm (0.94 in) |

**CAUTION:**

**Avoid scratching the skis when loading and unloading the snowmobile, when riding in areas with little or no snow, or on sharp edges such as concrete, curbs, etc. This will wear or damage the skis.**



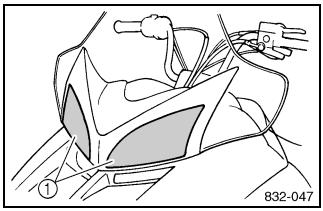

ESU00103

## Steering system

Check the handlebar for excessive free play:

1. Push the handlebar up and down and back and forth.
2. Turn the handlebar slightly to the right and left.

If excessive free play is noticed, consult a Yamaha dealer.




ESU00378

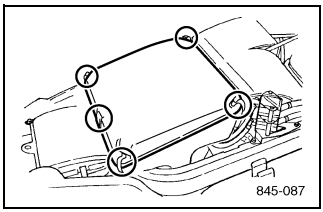
## Lights

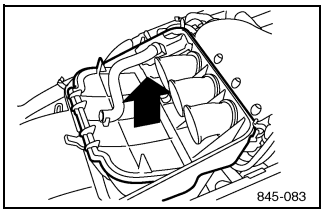
Check the lights.

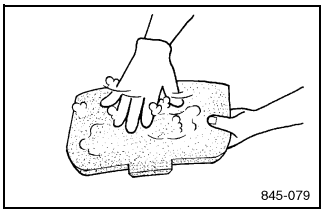
Replace any burned out bulbs.

**CAUTION:**

**Avoid using a scraper or hot water for cleaning the plastic lenses ①.**




ESU00350

## Air filter

Always check that no snow is under the air filter element. Remove the air filter case cover and take out the air filter element. If there is any snow under the air filter element, remove the snow. Then install the air filter element beneath the holding guides on the case and install the air filter case cover.

**NOTE:**

After riding the snowmobile, make sure that there is no snow under the air filter element.

ESU00110

## Fittings and fasteners

Check the tightness of the fittings and fasteners.
Tighten in proper sequence and torque if necessary.

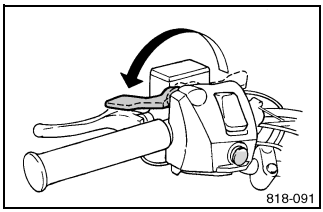
ESU00345

## Tool kit and recommended equipment

It is good practice to carry the tool kit, spare parts, and other necessary equipment with you while riding the snowmobile so that minor repairs can be done if necessary. The following should be carried at all times:

- Tool kit
- Flashlight
- Roll of plastic tape
- Steel wire
- Towrope
- Jumper cables
- V-belt
- Light bulbs
- Spark plugs

When you start out for a long distance trip, extra fuel and oil should be carried as well.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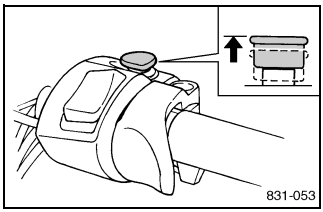
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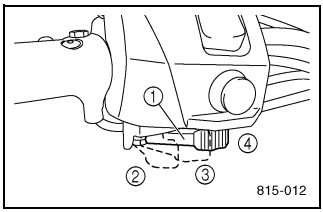

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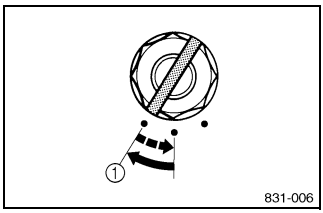


831-006

ESU00112

# OPERATION

ESU00366

## Starting the engine

**⚠ WARNING**

- **Be sure to check the "SAFETY INFORMATION" section carefully before starting the engine.**
- **Make sure that the parking brake is applied.**

**NOTE:**

Make sure that the engine stop switch is in the on position. The starter motor cannot be operated when the engine stop switch is in the off position.

1. Fully open the starter lever (choke).

① Starter lever (choke)
② Fully open (cold engine starting)
③ Half-open (warm engine up)
④ Closed (warm engine starting)

**NOTE:**

The starter lever (choke) is not required when the engine is warm. Put the starter lever (choke) in the closed position.

2. Turn the main switch to the "START" position. After the engine starts, put the starter lever (choke) in the half-open position. Warm up the engine until it does not run roughly or begin to stall when the starter lever is returned to the closed position.

① "START"

**CAUTION:**

- **Release the switch immediately after the engine starts.**
- **If the engine fails to start, release the switch, wait a few seconds, then try again. Each attempt should be as short as possible to preserve the battery. Do not crank the engine more than 10 seconds on any one attempt.**

ESU00380

## Break-in

There is never a more important period in the life of your engine than the period between 0 and 500 km (300 mi). For this reason, you should read the following material carefully.

Since the engine is brand new, do not put an excessive load on it for the first 500 km (300 mi). The various parts in the engine wear and polish themselves to the correct operating clearances. During this period, prolonged full-throttle operation or any condition that might result in engine overheating must be avoided.

**Operating your snowmobile for the first time**

Start the engine and let it idle for 15 minutes.

**0–160 km (0–100 mi)**

Avoid prolonged operation above 6,000 r/min.

**160–500 km (100–300 mi)**

Avoid prolonged operation above 8,000 r/min.

**500 km (300 mi) and beyond**

The snowmobile can now be operated normally.

**CAUTION:**

- **After 800 km (500 mi) of operation, the engine oil must be changed and the oil filter cartridge replaced.**
- **If any engine trouble should occur during the engine break-in period, immediately have a Yamaha dealer check the snowmobile.**

ESU01272

## Riding your snowmobile

### Getting to know your snowmobile

A snowmobile is a rider active vehicle, and your riding position and your balance are the two basic factors of maneuvering your snowmobile.

Riding your snowmobile requires skills acquired through practice over a period of time. Take the time to learn the basic techniques well before attempting more difficult maneuvers.

Riding your new snowmobile can be a very enjoyable activity, providing you with hours of pleasure. However, it is essential to familiarize yourself with the operation of the snowmobile to achieve the skill necessary to enjoy riding safely. Before operating the snowmobile, read this Owner's Manual completely and understand the operation of the controls.

Pay particular attention to the safety information on pages 3-1–3-3.

Please read all warning and caution labels on your snowmobile. Also, read the Snowmobiler's Safety Handbook that is supplied with your snowmobile.

### Learning to ride your snowmobile

Before you ride, always perform the pre-operation checks listed on pages 8-1–8-3. The short time spent checking the condition of the snowmobile will be rewarded with added safety and a more reliable snowmobile. Always wear the proper clothing for both warmth and to help protect you from injury if an accident occurs.

Become familiar with operating your snowmobile at low speeds, even if you are an experienced rider. Do not attempt to operate at maximum performance until you are totally familiar with the snowmobile's handling and performance characteristics.

Set the parking brake and follow the instructions on pages 7-1–7-2 to start the engine. Once the engine has warmed up, you are ready to begin riding your snowmobile.

### To start out and accelerate

1. With the engine idling, release the parking brake.
2. Apply the throttle slowly and smoothly. The V-belt clutch will engage and you will start to accelerate.

**⚠ WARNING**

**The operator should always keep both hands on the handlebar. Never put your feet outside the running boards. Avoid high speeds until you have become thoroughly familiar with your snowmobile and all of its controls.**

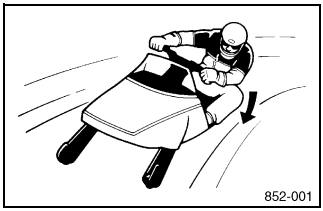
### Braking

When slowing down or stopping, release the throttle and apply the brake gently—not suddenly.

**⚠ WARNING**

- **Many surfaces such as ice and hard-packed snow require much longer stopping distances. Be alert, plan ahead, and begin decelerating early.**
- **Improper use of the brake can cause the drive track to lose traction, reduce control, and increase the possibility of an accident.**

## Turning




For most snow surfaces, “body English” is the key to turning.

As you approach a curve, slow down and begin to turn the handlebar in the desired direction. As you do so, put your weight on the running board to the inside of the turn and lean your upper body into the turn.

This procedure should be practiced at low speeds many times, in a large flat area with no obstacles. Once you have learned this technique, you should be able to perform it at higher speeds or in tighter curves. Lean more as the turn gets sharper or is made at higher speeds.

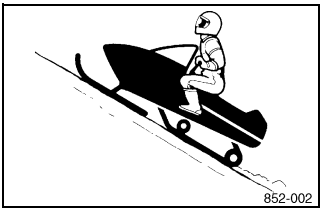
Improper riding techniques such as abrupt throttle changes, excessive braking, incorrect body movements, or too much speed for the sharpness of the turn may cause the snowmobile to tip.

If your snowmobile begins to tip while turning, lean more into the turn to regain balance. If necessary, gradually let off on the throttle or steer to the outside of the turn.

**Remember:**

Avoid higher speeds until you are thoroughly familiar with the operation of your snowmobile.

## Riding uphill



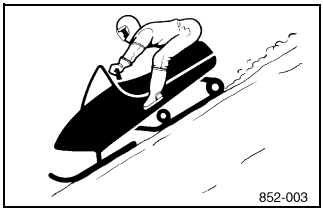

You should practice first on gentle slopes. Try more difficult climbs only after you have developed your skill. As you approach a hill, accelerate before you start the climb, and then reduce the throttle to prevent track slippage. It is also important to keep your weight on the uphill side at all times. On climbs straight up the hill, this can be accomplished by leaning forward and, on steeper inclines, standing on the running boards and leaning forward over the handlebar. (Also see “Traversing a slope.”)

Slow down as you reach the crest of the hill, and be prepared to react to obstacles, sharp drops, or other vehicles or people which may be on the other side. If you are unable to continue up a hill, do not spin the track. Stop the engine and set the parking brake. Then pull the rear of the snowmobile around to point the snowmobile back down the hill. When the snowmobile is pointed downhill, mount your snowmobile from the uphill side. Restart the engine, release the parking brake, and descend the hill.

**⚠ WARNING**

**Side hills and steep slopes are not recommended for a novice snowmobiler.**

### Riding downhill

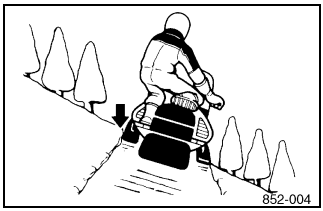



When riding downhill, keep speed to a minimum. It is important to apply just enough throttle to keep the clutch engaged while descending the hill. This will allow you to use engine compression to help slow the snowmobile, and to keep the snowmobile from rolling freely down the hill. Also apply the brake frequently, with light pressure.

**⚠ WARNING**

**Use extra caution when applying the brake during a descent. Excessive braking will cause the drive track to lock, causing a loss of control.**

### Traversing a slope




**⚠ WARNING**

**Traversing slopes is not recommended for a novice snowmobiler.**

Traversing a slope requires you to properly position your weight to maintain proper balance. As you travel across the slope, lean your body to position your weight towards the uphill side. A recommended riding position is to kneel with the knee of your downhill leg on the seat and the foot of your uphill leg on the running board. This position will make it easier for you to shift your body weight as needed.

Snow and ice are slippery, so be prepared for the possibility that your snowmobile could begin to slip sideways on the slope. If this happens, steer in the direction of the slide if there are no obstacles in your path. As you regain proper balance, gradually steer again in the direction you wish to travel.

If your snowmobile starts to tip, steer down the hill to regain balance.

**⚠ WARNING**

**If you are unable to maintain correct balance, and your snowmobile is going to tip over, dismount your snowmobile immediately on the uphill side.**

### Ice or icy surface

Operating on ice or icy surfaces can be very dangerous. Traction for turning, stopping, and starting is much less than that on snow.

**⚠ WARNING**

**When you have to operate on ice or icy surfaces, drive slowly and cautiously. Avoid accelerating, turning, and braking rapidly. Steering is minimal and uncontrolled spins are an ever-present danger.**

### Hard-packed snow

It can be more difficult to negotiate on hard-packed snow as both the skis and drive track do not have as much traction as when the snowmobile is operated on fresh snow. Avoid rapid acceleration, turning, and braking.

### Operation on surfaces other than snow or ice

Operation of your snowmobile on surfaces other than snow or ice should be avoided. Operation under such conditions will damage or result in rapid wear of the ski runners, drive track, slide runners, and drive sprockets. Operation of the snowmobile on the following surfaces should be avoided at all times:

1. Dirt
2. Sand
3. Rocks
4. Grass
5. Bare pavement

Other surfaces that should be avoided for the sake of drive track and slide runner life are:

1. Glare ice surfaces
2. Snow mixed with a lot of dirt and sand

All of the above surfaces have one thing in common in regard to drive track and slide runners; little or no lubricating ability. Drive track and all slide rail systems require lubrication (snow or water) between the slide runners and the slide metal. In the absence of lubrication, the slide runners will rapidly wear and in severe cases, literally melt away, and the drive track will be subject to damage or failure.

Also traction aids such as studs, cleats, etc., may cause further track damage or failure.

**⚠ WARNING**

**Drive track damage or failure could result in loss of braking ability and snowmobile control, which could cause an accident.**

- **Always check the drive track for damage or maladjustment before operating the snowmobile.**
- **Do not operate the snowmobile if you find damage to the drive track.**

**CAUTION:**

**Ride on fresh snow frequently. Operating on ice or hard-packed snow will rapidly wear the slide runners.**

ESU00251

## Maximizing drive track life
### Recommendations

**Track tension**

During initial break-in, the new drive track will tend to stretch quickly as the track settles. Be sure to correct the track tension and alignment frequently. (See pages 8-29–8-31 for adjustment procedures.) A loose track can slip (ratchet), derail or catch on suspension parts causing severe damage. Do not overtighten the drive track, otherwise it may increase the friction between the track and the slide runners, resulting in the rapid wear of both components. Also, this may put an excessive load on the suspension components, resulting in component failure.

**Marginal snow**

The drive track and the slide runners are lubricated and cooled by snow and water. To prevent the drive track and slide runners from overheating, avoid sustained high-speed usage in areas such as icy trails, frozen lakes and rivers that have minimal snow coverage. An overheated track will be weakened internally, which may cause failure or damage.

**Off-trail riding**

Avoid off-trail riding until there is sufficient snow coverage. It generally takes several feet of snow to provide a good overall base to properly cover debris, such as rocks, logs, etc. If snow coverage is not sufficient, stay on trails to avoid impact damage to the drive track.

**Studded track**

In general, track life will be shortened when studs are installed. Drilling stud holes into the drive track will cut the internal fibers, which weakens the track. Avoid spinning the drive track. Studs may catch on an object and pull out of the track, leaving tears and damage around the already weakened area. To minimize possible damage, consult your stud manufacturer for installation and stud pattern recommendations.

**Yamaha does not recommend track studding.**

ESU04360

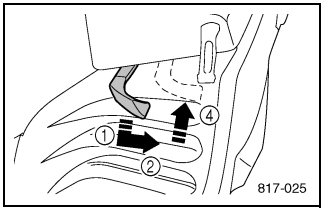
## Driving

**⚠ WARNING**

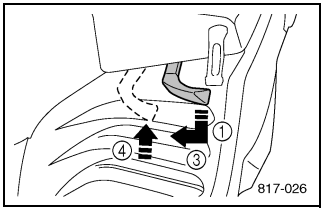
**Be sure to read the "SAFETY INFORMATION" and "Riding your snowmobile" sections carefully before operating the snowmobile.**

**NOTE:**

Make sure that the engine is warmed up enough before riding.




1. To select the desired operating position, pull the shift lever out, slide it to "FWD" or to "REV" until it stops, and then release it.




① Pull out
② Slide to "FWD" (Forward)
③ Slide to "REV" (Reverse)
④ Release

**⚠ WARNING**

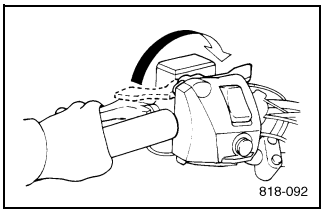
- **Make sure that the throttle lever is fully released and the snowmobile is at a full stop before shifting.**
- **Be sure to slide the shift lever to "FWD" or "REV" until it stops completely and only while the engine is idling.**
- **Make sure that the area behind the snowmobile is clear before reversing. Watch behind.**
- **Reduce speed and avoid sharp turning when operating the snowmobile in reverse.**

**CAUTION:**

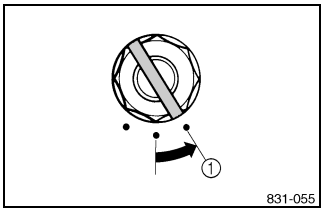
**Do not shift from "FWD" to "REV" or from "REV" to "FWD" while the snowmobile is moving. Otherwise, the drive system could be damaged.**

**NOTE:**

The reverse buzzer beeps while the shift lever is in reverse.




2. Release the parking brake by moving the parking brake lever to the right.
3. Press the throttle lever slowly to move the snowmobile.
4. Turn the handlebar in the desired direction.
5. Squeeze the brake lever to stop the snowmobile.
6. Apply the parking brake by moving the parking brake lever to the left.

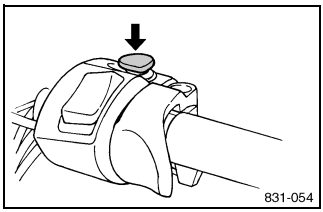



ESU00136

### Stopping the engine

Turn the main switch to the “OFF” position to stop the engine.

① “OFF”




**⚠ WARNING**

- **Push down the engine stop switch to stop the engine in an emergency.**
- **Make sure that the key is removed from the main switch whenever the operator leaves the snowmobile, to prevent accidental starting.**

ESU00367

## Transporting

When transporting your snowmobile on a trailer or in a truck, observe the following recommendations to help protect it from damage:

- Make sure that the fuel level in the fuel tank is lower than the bottom of the carburetors. Otherwise, the vibration and bumps from the road surface could make it possible for fuel to flow through the carburetors into the cylinders. This can result in “hydrostatic lock,” a condition where the engine cannot rotate because of fuel accumulated in the engine. Severe engine damage can result from hydrostatic lock. When possible, the fuel tank should be empty during transportation, especially if the trip takes longer than 30 minutes.
- If transporting the snowmobile in an open trailer or truck, put a tight fitting cover on the snowmobile. A cover specifically designed for your snowmobile is best. This will help keep foreign objects out of the cooling vents in the shroud, and also help protect the snowmobile against damage from debris on the road.
- If transporting the snowmobile in an open trailer or truck in areas where road salt is used, coat metal suspension surfaces lightly with oil or another protectant. This will help protect against corrosion. Be sure to clean the snowmobile when you get to your destination to remove any corrosive salts.

ESU00139

# PERIODIC MAINTENANCE

ESU00140

## Periodic maintenance chart

Regular maintenance is most important for best performance and safe operation.

| Item | Remarks | Pre-operation check (Daily) | Initial 1 month or 800 km (500 mi) (40 hr) | Every Seasonally or 3,200 km (2,000 mi) (160 hr) | Page |
|---|---|---|---|---|---|
| Spark plugs | Check condition.<br>Adjust gap and clean.<br>Replace if necessary. | | | ● | 8-4–8-5 |
| * Valve clearance | Check clearance.<br>Adjust clearance when engine is cold. | Every 40,000 km (25,000 mi) | | | 8-9 |
| Engine oil | Check oil level. | ● | | | 6-3–6-4 |
| | * Replace. | | ● | ● | |
| Engine oil filter cartridge | Replace. | | ● | Every 20,000 km (12,000 mi) | 8-10–8-12 |
| Fuel | Check fuel level. | ● | | | 6-1–6-2 |
| * Fuel filter | Check condition.<br>Replace if necessary. | | | ● | |
| * Fuel line | Check fuel hose for cracks or damage.<br>Replace if necessary. | | | ● | |
| Engine coolant | Check coolant level. | ● | | | 6-4, 8-13–8-14 |
| | * Air bleed the cooling system if necessary. | | | ● | 8-13 |
| Carburetor | Check throttle lever operation. | ● | | | 5-2, 6-5 |
| | * Adjust the jets. | Whenever operating condition (elevation/temperature) is changed. | | | |
| Engine stop switch | Check operation.<br>* Repair if necessary. | ● | | | 5-8 |
| Throttle override system (T.O.R.S.) | Check operation.<br>* Repair if necessary. | ● | | | 5-3, 6-5 |
| Throttle lever | Check operation.<br>* Repair if necessary. | ● | | | 5-2, 6-5 |
| * Exhaust system | Check for leakage.<br>Tighten or replace gasket if necessary. | | | ● | |

* It is recommended that these items be serviced by a Yamaha dealer.

| Item | Remarks | Pre-operation check (Daily) | Initial 1 month or 800 km (500 mi) (40 hr) | Every Seasonally or 3,200 km (2,000 mi) (160 hr) | Page |
|---|---|---|---|---|---|
| Drive guard | Check for cracks, bends or damage.<br>* Replace if necessary. | ● | | | 5-10, 6-7 |
| V-belt | Check for wear and damage.<br>Replace if necessary. | ● | | | 6-7, 8-15–8-17 |
| Drive track and idler wheels | Check deflection, and for wear and damage.<br>* Adjust/replace if necessary. | ● | | | 6-8, 8-29–8-31 |
| Slide runners | Check for wear and damage. | ● | | | 6-8 |
| | * Replace if necessary. | | | ● | |
| Brake and parking brake | Check operation and fluid leakage. | ● | | | 5-8–5-9, 6-6–6-7, 8-19–8-20 |
| | * Adjust free play and/or replace pads if necessary. | | | ● | |
| | * Replace brake fluid. | See NOTE on page 8-3. | | | 8-20 |
| * Disc brake installation | Check for slight free play.<br>Lubricate shaft with specified grease as required. | | | Every 1,600 km (1,000 mi) | |
| Drive chain oil | Check oil level. | | ● | | 8-17–8-18 |
| | * Replace. | | | ● | |
| Drive chain | Check deflection.<br>* Adjust if necessary. | Initial at 500 km (300 mi) and every 800 km (500 mi) thereafter. | | | 8-18 |
| Skis and ski runners | Check for wear and damage. | ● | | | 6-9 |
| | * Replace if necessary. | | | ● | |
| Steering system | Check operation. | ● | | | 6-9 |
| | * Adjust toe-out if necessary. | | | ● | |
| Lights | Check operation.<br>Replace bulbs if necessary. | ● | | | 6-9, 8-35 |
| * Battery | Check condition.<br>Charge if necessary. | | | ● | 8-36 |

* It is recommended that these items be serviced by a Yamaha dealer.

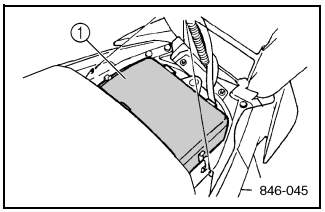
| Item | Remarks | Pre-operation check (Daily) | Initial 1 month or 800 km (500 mi) (40 hr) | Every Seasonally or 3,200 km (2,000 mi) (160 hr) | Page |
|---|---|---|---|---|---|
| * Primary and secondary clutches | Check engagement and shift speed.<br>Adjust if necessary. | | | ● | |
| | | Whenever operating elevation is changed. | | | |
| | Inspect sheaves for wear/damage.<br>Inspect weights/rollers and bushings for wear-for primary.<br>Inspect ramp shoes/bushings for wear-for secondary.<br>Replace if necessary. | | | ● | |
| | Lubricate with specified grease. | | | ● | |
| * Steering column bearing | Lubricate with specified grease. | | | ● | |
| * Ski and front suspension | Lubricate with specified grease. | | | ● | 8-34 |
| * Suspension component | Lubricate with specified grease. | | | ● | 8-34 |
| * Parking brake cable end and lever end/ throttle cable end | Lubricate with specified grease. | | | ● | 8-34 |
| | Check cable damage.<br>Replace if necessary. | | | ● | |
| Shroud latches | Make sure that the shroud latches are hooked. | ● | | | 5-10 |
| Fittings and fasteners | Check tightness.<br>* Repair if necessary. | ● | | | 6-11 |
| Tool kit and recommended equipment | Check for proper placement. | ● | | | 6-11 |

* It is recommended that these items be serviced by a Yamaha dealer.

**NOTE:**

Brake fluid replacement:

1. When disassembling the master cylinder or caliper cylinder, replace the brake fluid. Normally check the brake fluid level and add the fluid as required.
2. On the inner parts of the master cylinder and caliper cylinder, replace the oil seals every two years.
3. Replace the brake hose every four years, or if cracked or damaged.




ESU00376

## Tool kit

The owner's tool kit has the tools which are sufficient for most periodic maintenance and minor repair. A torque wrench is also necessary to properly tighten nuts and bolts.

① Tool kit

**CAUTION:**

**Before starting the engine, make sure that the tool kit is firmly seated in the holder and is closed securely.**

**NOTE:**

If you do not have a torque wrench available during a service operation requiring one, take your snowmobile to a Yamaha dealer to check the torque settings and adjust them if necessary.

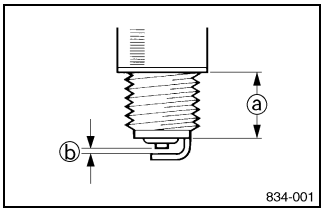
ESU00368

## Spark plug inspection

The spark plug is an important engine component and is easy to inspect. The condition of the spark plug can indicate the condition of the engine. Check the coloration on the white porcelain insulator around the center electrode. The ideal coloration at this point is a medium to a light tan color for a snowmobile that is being ridden normally. If a spark plug shows a distinctly different color, there could be something wrong with the engine. For example, a very white center electrode porcelain color could indicate an intake track air leak or carburetion problem for that cylinder. Do not attempt to diagnose such problems yourself. Instead, take the snowmobile to a Yamaha dealer for inspection and possible repairs. You should periodically remove and inspect the spark plug because heat and deposits will cause a spark plug to slowly break down and erode. Consult a Yamaha dealer before changing to a different type of spark plug.

Specified spark plug:
· R · CR8E (NGK) or CR8E (NGK)

Spark plugs are produced in several different thread lengths. The thread length or reach is the distance from the spark plug gasket seat to the end of the threaded portion. If the reach is too long, overheating and engine damage may result. If the reach is too short, spark plug fouling and poor performance may result. Also, if the reach is too short, carbon will form on the exposed threads resulting in combustion chamber hot spots and thread damage. Always use a spark plug with the specified reach.




| |
|---|
| Spark plug reach ⓐ: 19.0 mm (0.75 in) |

Before installing any spark plug, measure the electrode gap with a wire thickness gauge and adjust to specification.

| |
|---|
| Spark plug gap ⓑ: 0.7–0.8 mm (0.028–0.031 in) |

When installing the spark plug, always clean the gasket surface. Wipe off any grime from the threads and tighten the spark plug to the specified torque.

| |
|---|
| Spark plug tightening torque:<br>12.5 Nm (1.25 m·kgf, 9 ft·lb) |

**CAUTION:**

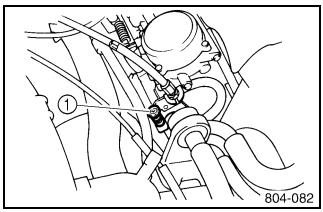
**Make sure that the spark plug caps are securely installed. Otherwise the spark plug caps could be damaged due to engine vibration.**

ESU00370

## Engine idle speed adjustment

**CAUTION:**

- **Be sure to have a Yamaha dealer make this adjustment.**
- **Make sure that the throttle lever moves smoothly.**
- **Make sure that the carburetor is synchronized first.**




1. Start the engine and warm it up.

**NOTE:**

Refer to the “Starting the engine” section.

2. Turn the throttle stop screw ① in or out to adjust the engine idle speed.

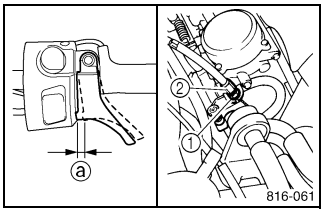
Standard engine idle speed: 1,400 ± 100 r/min

ESU01471

## Throttle cable adjustment

**CAUTION:**

**Be sure to adjust the engine idle speed first.**




1. Loosen the locknut.
2. Turn the adjuster in or out until the proper throttle lever free play is achieved.

Throttle lever free play ⓐ:
2.0–3.0 mm (0.08–0.12 in)

① Locknut
② Adjuster

3. Tighten the locknut.

ESU04190

## Carburetor adjustment

**CAUTION:**

- **Be sure to have a Yamaha dealer make this adjustment.**
- **Make sure that the air filter case is installed during running to prevent engine damage.**

Under some operating conditions the carburetor setting may have to be changed due to air temperature changes, elevation changes, use of alcohol oxygenated fuels, etc., and should be set by a Yamaha dealer.

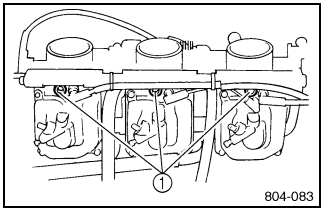
**CAUTION:**

**The drive chain gears and V-belt clutch should be adjusted when operating over a high altitude of 900 m (3,000 ft). Consult a Yamaha dealer.**

### Pilot screw adjustment

Turn the pilot screw in or out to adjust low speed tuning.

Standard pilot screw position:
2 turns out from the seated position.




| Pilot screw ① | Mixture | Condition |
|---|---|---|
| Turn in | Lean | Warm weather |
| | | High altitude |
| Turn out | Rich | Cold weather |
| | | Low altitude |

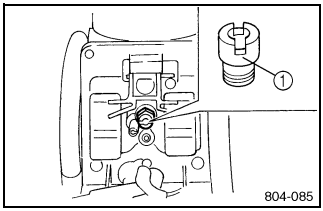
**Main jet replacement**

Replace the main jet according to the setting chart which is available at a Yamaha dealer.

**⚠ WARNING**

- **Never remove the drain plug or the float chamber while the engine is hot. Fuel will flow out from the float chamber which could ignite and cause injury.**
- **Place a rag under the carburetor before removing the drain plug or float chamber to catch any spilled fuel.**
- **Handle fuel with care: it is HIGHLY FLAMMABLE.**

Standard main jet:
# 148




| Main jet ① | Mixture | Condition |
|---|---|---|
| Small No. | Lean | Warm weather |
| | | High altitude |
| Large No. | Rich | Cold weather |
| | | Low altitude |

1. Loosen the carburetor clamps and remove all hoses and cables, and then remove the carburetor.
2. Pinch the fuel hose to prevent fuel flowing.
3. Remove the float chamber and install the proper main jet.
4. Assemble by reversing the removal steps.

**⚠ WARNING**

**Make sure that all hoses and clamps are properly installed.**

ESU00157

## High altitude adjustments

Operating at high altitude reduces the performance of a gasoline engine to about 3% for every 305 m (1,000 ft) of elevation. This is because there is less air as altitude increases. Less air means less oxygen available for combustion.

Your snowmobile can be adjusted to overcome most of the problems found in high altitude riding. Carburetor adjustments are the most important. Less air at high altitude makes the air/fuel ratio too rich, which can cause poor performance. Common problems are hard starting, bogging, and plug fouling. Follow the Main Jet Setting chart which is available at a Yamaha dealer carefully. Proper carburetion adjustments will correct the air/fuel ratio.

**Remember:** less air at higher altitude means there is less horsepower available, even with proper carburetion. Expect acceleration and top speed to be reduced at higher altitudes.

To overcome operating with less power at high altitudes, your snowmobile may also require different settings for the drive chain gears and V-belt clutch to avoid poor performance and rapid wear. If you plan to operate your snowmobile at an altitude different from the area where you bought it, be sure to consult a Yamaha dealer. They can tell you if there are any changes necessary for the altitude where you plan to ride.

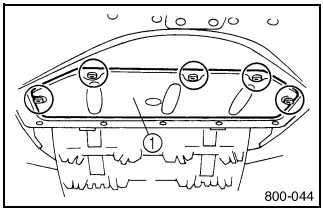
**CAUTION:**

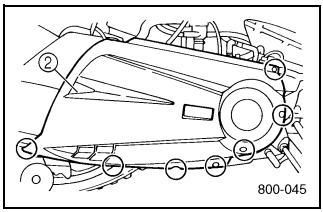
**The drive chain gears and V-belt clutch should be adjusted when operating over a high altitude of 900 m (3,000 ft). Consult a Yamaha dealer.**

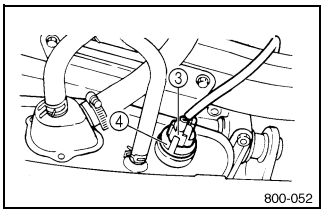
ESU00348

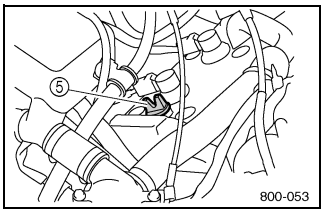
## Adjusting the valve clearance

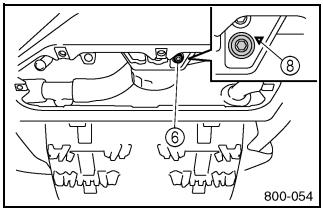
The valve clearance changes with use, resulting in improper air-fuel mixture and/or engine noise. To prevent this from occurring, the valve clearance must be adjusted by a Yamaha dealer at the intervals specified in the periodic maintenance chart.

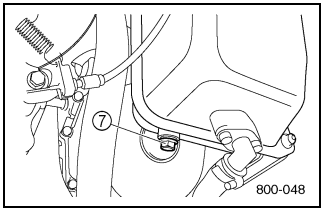



ESU04200

## Changing the engine oil

It is recommended to have a Yamaha dealer change the engine oil.

### ⚠ WARNING

**Engine oil is extremely hot immediately after the engine is turned off. Coming into contact with or getting any engine oil on your clothes could result in burns.**

### CAUTION:

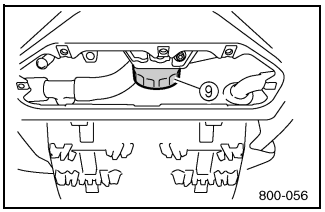
- **Do not run the engine with too much or not enough oil in the oil tank. Oil could spray out or the engine could be damaged.**
- **Be sure to change the engine oil after the first 800 km (500 mi) of operation, and every 3,200 km (2,000 mi) thereafter or at the start of a new season, otherwise the engine will wear quickly.**
- **The oil filter cartridge should be replaced every 20,000 km (12,000 mi) of operation.**

**To change the engine oil (with or without oil filter cartridge replacement)**

1. Place the snowmobile on a level surface and apply the parking brake.
2. Remove the bottom panel ① and right side cover ②.
3. Start the engine, warm it up for several minutes, and then turn it off.
4. Place oil pans under both the engine and the oil tank to collect the used oil.
5. Disconnect the oil level gauge coupler ③.
6. Remove the oil level gauge/dipstick ④ and the cylinder head cap ⑤, and then remove the crankcase engine oil drain bolt ⑥ and the oil tank engine oil drain bolt ⑦ to drain the oil from the crankcase and the oil tank.

**NOTE:**

- A " ▽ " mark ⑧ is stamped on the crankcase near the crankcase engine oil drain bolt.
- Dispose of used oil according to local regulations.
- Skip steps 7–9 if the oil filter cartridge is not being replaced.




7. Remove the oil filter cartridge ⑨ with an oil filter wrench.

**NOTE:**

An oil filter wrench is available at a Yamaha dealer.

8. Apply a thin coat of engine oil to the O-ring of the new oil filter cartridge.
9. Install the new oil filter cartridge with an oil filter wrench, and then tighten it to the specified torque.

Tightening torque:
Oil filter cartridge:
17 Nm (1.7 m·kgf, 12 ft·lb)

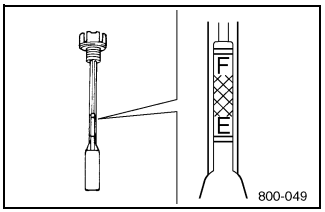
10. Install the engine oil drain bolts, and then tighten them to the specified torques.

Tightening torques:
Crankcase engine oil drain bolt:
10 Nm (1.0 m·kgf, 7.2 ft·lb)
Oil tank engine oil drain bolt:
16 Nm (1.6 m·kgf, 11 ft·lb)

11. Add 2.0 L (1.8 Imp qt, 2.1 US qt) of the recommended engine oil to the oil tank, and then install and tighten the oil level gauge/dipstick and the cylinder head cap.

Recommended engine oil:
See page 6-2.
Oil quantity:
With oil filter cartridge replacement:
3.0 L (2.6 Imp qt, 3.2 US qt)
Without oil filter cartridge replacement:
2.8 L (2.5 Imp qt, 3.0 US qt)
Total amount:
3.7 L (3.3 Imp qt, 3.9 US qt)

12. Start the engine, warm it up for several minutes, and then turn it off.




13. Add sufficient oil of the recommended type to raise it to the “F” level mark on the oil level gauge/dipstick. (See page 6-3 for the checking procedure.)

**CAUTION:**

- **When adding the engine oil, be careful not to fill above the “F” level mark on the oil level gauge/ dipstick.**
- **Make sure that no foreign material enters the engine oil tank.**

14. Start the engine, and then let it idle for several minutes while checking it for oil leakage. If oil is leaking, immediately turn the engine off and make sure the engine oil drain bolts, cylinder head cap, and oil level gauge/dipstick are installed correctly.
15. Turn the engine off, connect the oil level gauge coupler, and then install the bottom panel and right side cover.

**CAUTION:**

**If oil is leaking or the oil level warning indicator comes on when the engine is running, immediately turn the engine off and have a Yamaha dealer check the snowmobile. Continuing to operate the engine under such conditions could cause severe engine damage.**

ESU03171

## Cooling system

### Bleeding the cooling system

**⚠ WARNING**

- **Do not remove the coolant reservoir cap when the engine is hot. Scalding hot fluid and steam may be blown out under pressure, which could cause serious injury.**
  **When the engine has cooled, place a thick rag or towel over the coolant reservoir cap, and slowly rotate the cap counterclockwise to the detent. This procedure allows any residual pressure to escape. When the hissing sound has stopped, press down on the cap while turning counterclockwise and remove it.**
- **The cooling system must be bled of air if the coolant reservoir becomes empty, if air can be seen in the cooling system, or if there is a cooling system leak. Consult a Yamaha dealer.**

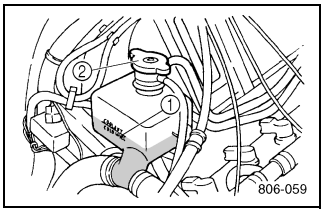
**CAUTION:**

**Operating the engine with an improperly bled cooling system can cause overheating and severe engine damage.**

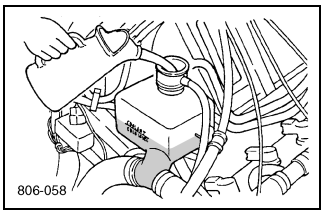
**Coolant replenishment**

1. Remove the coolant reservoir cap and add coolant until it reaches the “COLD LEVEL” mark.

| |
|---|
| Recommended coolant:<br>High quality ethylene glycol antifreeze containing corrosion inhibitors.<br>Antifreeze and water mixing ratio: 60:40<br>Total amount:<br>5.2 L (4.58 Imp qt, 5.50 US qt) |



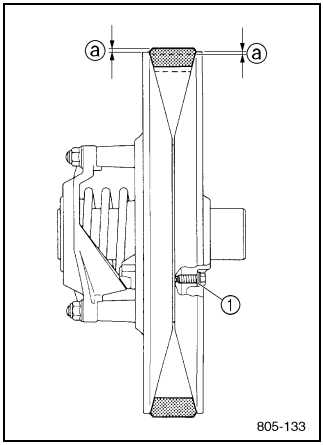

① “COLD LEVEL” mark
② Coolant reservoir cap




2. Start the engine and add coolant until the coolant level does not go down, and then stop the engine.
3. Fill the coolant reservoir with coolant until it reaches the “COLD LEVEL” mark.
4. Install the coolant reservoir cap. Check for any coolant leakage.

**NOTE:**

If you find any leaks, consult a Yamaha dealer.




ESU00166

### V-belt replacement

**⚠ WARNING**

**When installing the new V-belt, make sure it is positioned from 1.5 mm (0.06 in) above the edge of the secondary sheave assembly to 0.5 mm (0.02 in) below the edge ⓐ.**
**If not, the V-belt clutch engagement speed will be changed. The snowmobile may move unexpectedly when the engine is started.**
**Adjust the V-belt position by removing or adding a spacer ① on each adjusting bolt.**
**Have a Yamaha dealer make this adjustment.**

**CAUTION:**

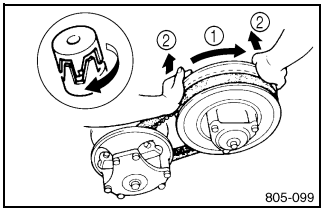
**As the V-belt wears, adjustment may be necessary. To ensure proper clutch performance, the V-belt position should be adjusted by adding a spacer on each adjusting bolt when the V-belt position reaches 1.5 mm (0.06 in) below the edge.**
**Have a Yamaha dealer make this adjustment.**

| | |
|---|---|
| New belt width | 34.5 mm (1.36 in) |
| Belt wear limit width | 32.5 mm (1.28 in) |

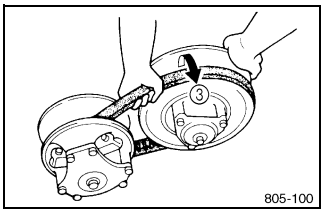
**NOTE:**

Apply the parking brake before replacing the V-belt.

1. Remove the drive guard.

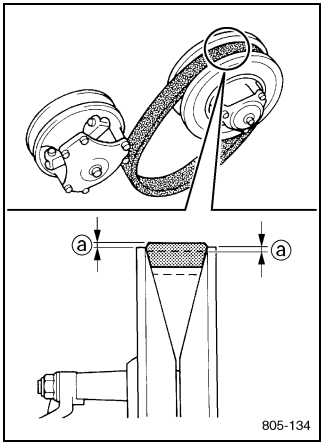



2. Rotate the secondary sliding sheave clockwise ① and push ② it so that it separates from the secondary fixed sheave.



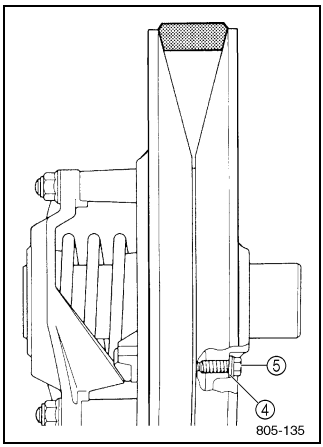

3. Pull ③ the V-belt up over the secondary fixed sheave.

4. Remove the V-belt from the secondary sheave assembly and primary sheave assembly.




5. Put the new V-belt back on the secondary sheave assembly only. Do not force the V-belt between the sheaves; the secondary sliding and fixed sheave must touch each other. Measure the V-belt position.

Standard V-belt position ⓐ:
From 1.5 mm (0.06 in) above the edge of the secondary sheave to 0.5 mm (0.02 in) below the edge.

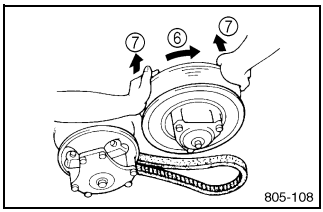



6. If the position is incorrect, adjust the V-belt position by removing or adding a spacer ④ on each adjusting bolt ⑤.

| V-belt position | Adjustment |
|---|---|
| More than 1.5 mm (0.06 in) above the edge | Remove spacer |
| From 1.5 mm (0.06 in) above the edge to 0.5 mm (0.02 in) below the edge | Not necessary (It is correct.) |
| More than 0.5 mm (0.02 in) below the edge | Add spacer |

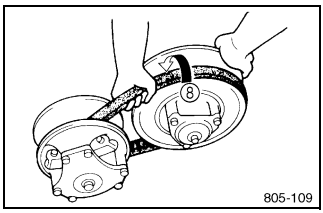
7. Tighten each adjusting bolt.

Adjusting bolt tightening torque:
10 Nm (1.0 m·kgf, 7.2 ft·lb)




8. Install the V-belt over the primary sheave assembly.

9. Rotate the secondary sliding sheave clockwise ⑥ and push ⑦ it so that it separates from the secondary fixed sheave.




10. Install the V-belt ⑧ between the secondary sliding and secondary fixed sheaves.

11. Install the drive guard.

**⚠ WARNING**

**Never run the engine with the V-belt or drive guard removed.**

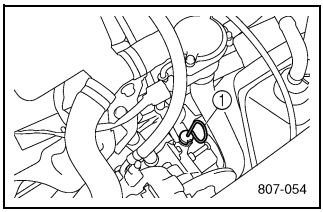
ESU03511

## Checking the drive chain housing oil level and the drive chain tension

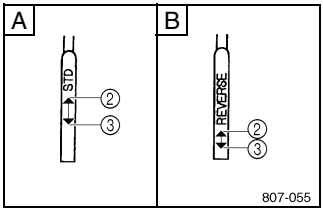
### Oil level check

**⚠ WARNING**

**The engine, oil tank, brake disc, and coolant hoses will be very hot after the engine has been run. Avoid contact while they are still hot with any part of your body or clothing during inspection or repair.**



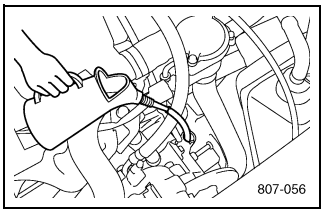

1. Place the snowmobile on a level surface.
2. Remove the dipstick ① and wipe it off with a clean rag. Then put the dipstick in the hole.




3. Remove the dipstick and check that the oil is between the upper and lower levels. If not, add oil to the upper level.

② Upper level
③ Lower level

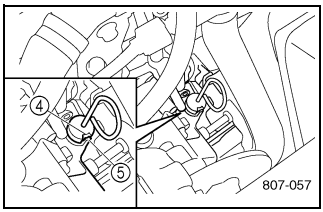
| Drive chain oil: GL-3<br>75W or 80W |
|---|



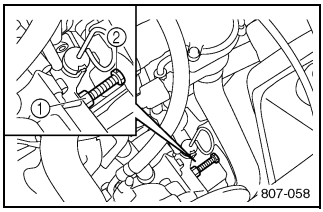

A For models without reverse transmissions (not applicable)
B For models with reverse transmissions (RST90)

**CAUTION:**

**Make sure that no foreign material enters the drive chain housing.**



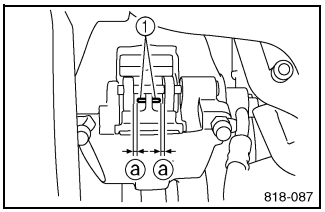

4. Install the dipstick and align the notch ④ of the dipstick handle with the projection ⑤ of the drive chain housing.




**Chain tension adjustment**

1. Loosen the locknut.
2. Turn the adjusting bolt clockwise until it is finger tight, and then loosen it 1/4 turn.
3. Hold the adjusting bolt in place while tightening the locknut.

① Locknut
② Adjusting bolt




ESU00174

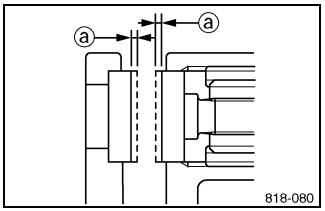
## Checking the brake pads

Check the brake pads for wear.

If the brake pads reach the wear limit, ask a Yamaha dealer to replace them.

① Brake pad wear indicator

| Wear limit ⓐ: 1.5 mm (0.06 in) |
|---|




ESU00352

## Checking the parking brake pads

Check the parking brake pads for wear by measuring the thickness of the pads. If the parking brake pads reach the wear limit, ask a Yamaha dealer to replace them.

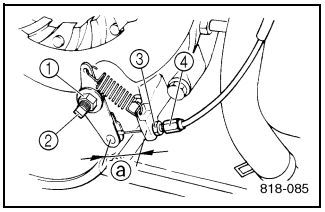
| Wear limit ⓐ: 1.2 mm (0.05 in) |
|---|

### Adjustment

As the parking brake pads wear, adjustment may be necessary to ensure proper brake performance.

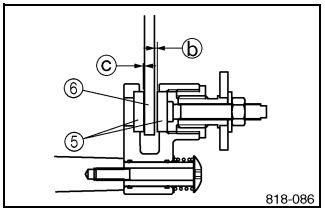
**⚠ WARNING**

**Be sure to have a Yamaha dealer make this adjustment.**




1. Loosen the locknut ① and the adjusting bolt ②.
2. Loosen the cable locknut ③.
3. Turn the cable adjuster ④ in or out to adjust the cable length.

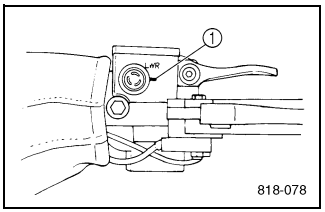
| Cable length ⓐ: 43.5–46.5 mm (1.713–1.831 in) |
|---|




4. Tighten the cable locknut.
5. Turn the adjusting bolt in or out to adjust the clearance between the parking brake pads ⑤ and the brake disc ⑥.

| Clearance ⓑ + ⓒ: 1.5–2.0 mm (0.059–0.079 in) |
|---|

6. Tighten the locknut.




ESU00180

### Checking the brake fluid level

Place the snowmobile on a level surface. Check that the brake fluid is above the lower level and replenish when necessary.

① Lower level

| Specified brake fluid: DOT 4 |
|---|

**⚠ WARNING**

**Be careful that water does not enter the master cylinder when refilling. Water will significantly lower the boiling point of the fluid and may result in vapor lock.**
**If the brake fluid level goes down, consult a Yamaha dealer.**

**CAUTION:**

**Brake fluid may deteriorate painted surfaces or plastic parts. Never spill any fluid. If any is spilled, clean it up immediately.**

ESU00181

### Brake fluid replacement

Brake fluid replacement is necessary when the following components are replaced during the periodic maintenance or if they are damaged or leaking.

a. All oil seals of the master cylinder and caliper cylinder
b. The brake hose

**⚠ WARNING**

**Make sure that the brake fluid and the above parts are replaced by a Yamaha dealer.**

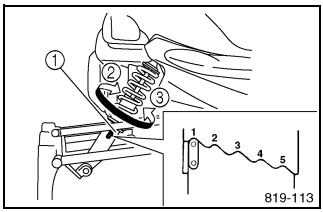
ESU00183

### Suspension

The suspension can be adjusted to suit rider preference. A softer setting, for example, may provide greater rider comfort, while a harder setting may allow more precise handling and control over certain types of terrain or riding conditions.

**⚠ WARNING**

**Be sure to have a Yamaha dealer make this adjustment.**




ESU03041

**Ski spring preload adjustment**

The spring preload can be adjusted by turning the spring preload adjuster ①.

| Spring adjuster position | 5 | 4 | 3 | 2 | 1 |
|---|---|---|---|---|---|
| Preload | ② Hard | | | | Soft ③ |
| Standard | 1 | | | | |

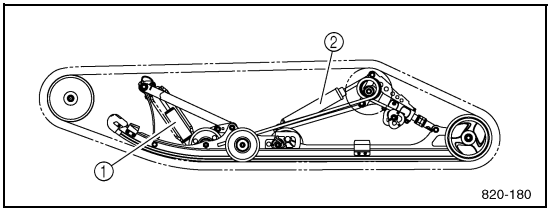
**CAUTION:**

**The left and right ski spring preload must be set to the same setting. Uneven settings can cause poor handling and loss of stability.**

ESU04350

**Rear suspension spring preload adjustment**

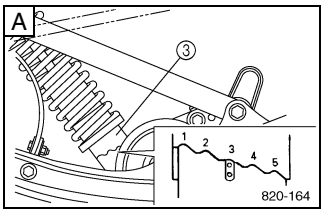
The rear suspension is equipped with two shock absorbers and the spring preload for each shock absorber can be adjusted separately. One shock absorber is in the front ① and the other is in the rear ② of the rear suspension assembly.



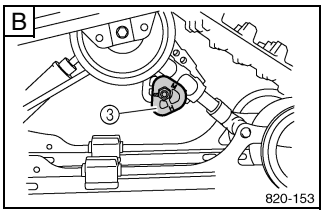

The spring preload can be adjusted by turning the spring preload adjuster ③ on the front and rear shock absorbers.

**⚠ WARNING**

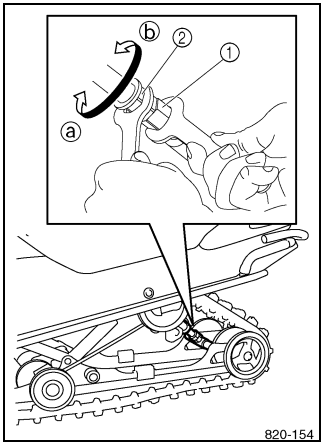
**Be sure to have a Yamaha dealer make this adjustment.**




| Spring adjuster position | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Preload | Soft | | | | Hard |
| A Standard (front) | | | 3 | | |




| Spring adjuster position | S | M | H |
|---|---|---|---|
| Preload | Soft | Medium | Hard |
| B Standard (rear) | | M | |



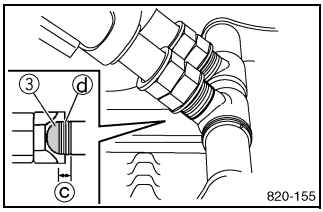

ESU04220

**Control rod adjustment**

The weight transfer can be adjusted by turning the control rod adjusting nut ①.

1. Loosen the locknut ② while holding the control rod adjusting nut.
2. Turn the adjusting nut in direction ⓐ to increase weight transfer or direction ⓑ to decrease weight transfer.
3. Tighten the locknut while holding the adjusting nut in place.

Locknut tightening torque:
25 Nm (2.5 m·kgf, 18 ft·lb)



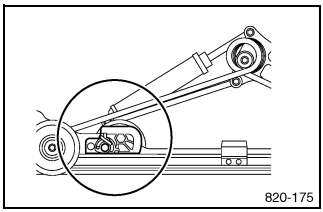

**CAUTION:**

- **When using the two wrenches included in the owner's tool kit, make sure that they are situated at a right angle to the control rod as shown, and that they are tightly fitted to the locknut and the control rod adjusting nut.**
- **The left and right adjusting nuts must be set to the same position. Uneven settings can cause poor handling and loss of stability.**

**⚠ WARNING**

**Never adjust the control rods beyond the maximum range indicated on the rods with red paint ③.**

ⓒ Adjustable range
ⓓ Standard position




ESU04341

**2-up adjusting block spring force adjustment**

The spring force can be adjusted by changing the position of the 2-up adjusting blocks.

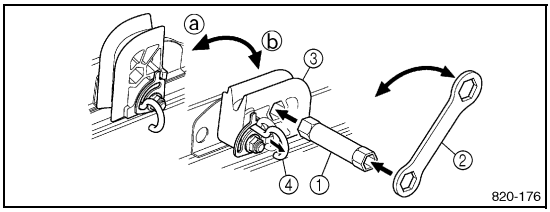
**NOTE:**

Be sure to make this adjustment when there is no load (rider or cargo) on the snowmobile.

1. Install the special tools ① and ② included in the owner's tool kit to the 2-up adjusting block ③.
2. Pull the lock lever ④ and turn the special tool ② to change the block position.
3. Release the lock lever.

**CAUTION:**

**Make sure that the 2-up adjusting blocks are installed in the same position on both sides of the snowmobile.**




ⓐ 2-up position (rider and passenger)
ⓑ Solo rider position

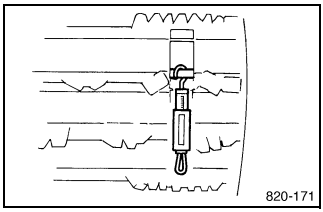
ESU03531

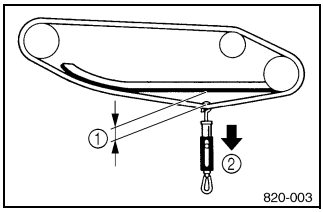
## Drive track adjustment

**⚠ WARNING**

**A broken track, track fittings or debris thrown by the drive track could be dangerous to an operator or bystanders. Observe the following precautions:**

- **Do not allow anyone to stand behind the snowmobile when the engine is running.**
- **When the rear of the snowmobile is raised to allow the drive track to spin, a suitable stand must be used to support the rear of the snowmobile. Never allow anyone to hold the rear of the snowmobile off the ground to allow the drive track to spin. Never allow anyone near a rotating drive track.**
- **Inspect the drive track condition frequently. Replace damaged slide metal. Replace the drive track if it is damaged to the depth where fabric reinforcement material is visible or support rods are broken. Otherwise, track damage or failure could result in loss of braking ability and snowmobile control, which could cause an accident.**




**Drive track deflection measurement**

1. Lay the snowmobile on its side.
2. Measure the drive track deflection with a spring scale. Pull at the center of the drive track with a force of 100 N (10 kg, 22 lb).

**NOTE:**

Measure the gap between the slide runner and the edge of the track window. Measure both sides.

① Deflection
② 100 N (10 kg, 22 lb)

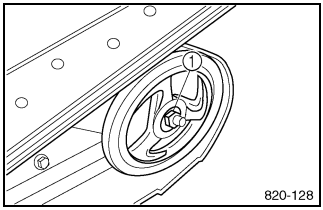
Standard drive track deflection:
30–35 mm (1.18–1.38 in) / 100 N (10 kg, 22 lb)

3. If the deflection is incorrect, adjust the drive track.

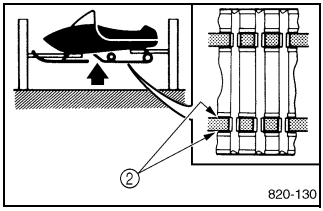
**Drive track adjustment**

**⚠ WARNING**

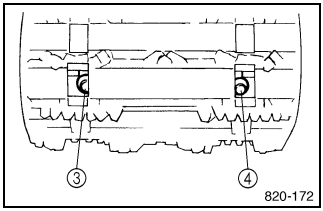
- **Be sure to have a Yamaha dealer make this adjustment.**
- **Support the snowmobile securely on a suitable stand before working underneath the snowmobile.**
- **Operate the engine in a well-ventilated area.**



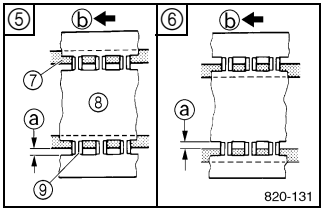

1. Lift the rear of the snowmobile onto a suitable stand to raise the drive track off the ground.
2. Loosen the rear axle nut ①.




3. Start the engine and rotate the drive track one or two turns. Stop the engine.
4. Check the drive track alignment with the slide runners ②. If the alignment is incorrect, align the drive track by turning the left and right adjusters.




| Drive track alignment | ⑤ Shifted to right | ⑥ Shifted to left |
|---|---|---|
| ③ Left adjuster | Turn out | Turn in |
| ④ Right adjuster | Turn in | Turn out |




⑦ Slide runners
⑧ Drive track
⑨ Slide metal
ⓐ Gap
ⓑ Forward

5. Adjust the drive track deflection to specification.

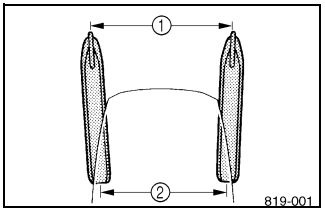
| Drive track deflection | More than specified | Less than specified |
|---|---|---|
| ③ Left adjuster | Turn in | Turn out |
| ④ Right adjuster | Turn in | Turn out |

**CAUTION:**

**The right and left adjusters should be turned to an equal amount.**

6. Recheck alignment and deflection. If necessary, repeat steps 3 to 5 until the proper adjustment is achieved.
7. Tighten the rear axle nut.

| Rear axle tightening torque:<br>75 Nm (7.5 m·kgf, 54 ft·lb) |
|---|



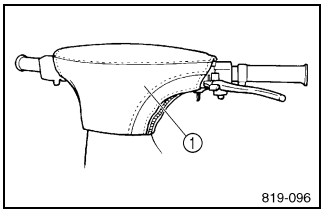

ESU00200

## Ski alignment

1. Turn the handlebar so the skis face straight ahead.
2. Check the following for ski alignment:
   a. Skis are facing forward.
   b. Ski toe-out (① – ②) is within specification.

| Ski toe-out (① – ②): 0–15 mm (0–0.59 in) |
|---|

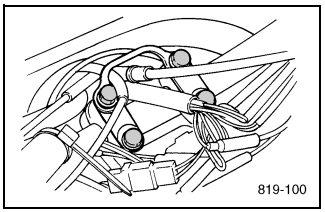
3. If the alignment is not correct, consult a Yamaha dealer.



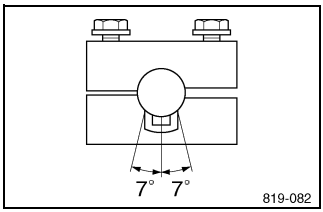

ESU03541

## Handlebar adjustment

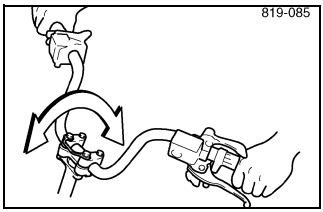
1. Remove the handlebar cover ①.

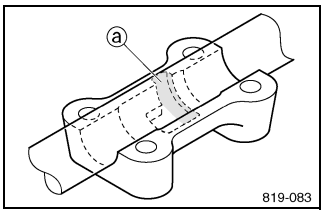



2. Loosen the handlebar bolts.




3. Move the handlebar up or down to adjust the handlebar height to the desired position.



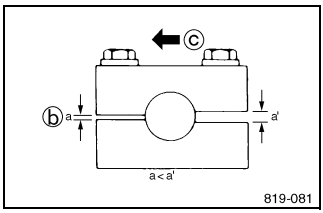




**CAUTION:**

**Make sure that the projection on the handlebar is not installed into the area ⓐ shown.**

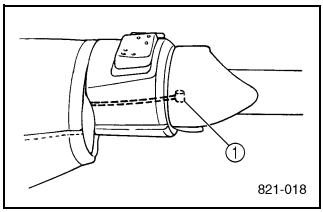
4. Tighten the handlebar bolts and install the handlebar cover.

Handlebar bolt tightening torque:
14.5 Nm (1.45 m·kgf, 11 ft·lb)




**CAUTION:**

**Make sure that the small gap ⓑ side of the handlebar holders faces forward ⓒ.**



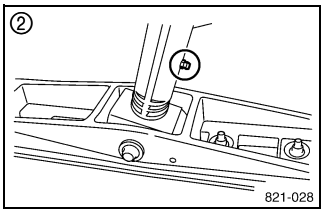

ESU00371

## Lubrication

Lubricate the following points.

| Lubricant: Low-temperature grease |
|---|

① Throttle cable end



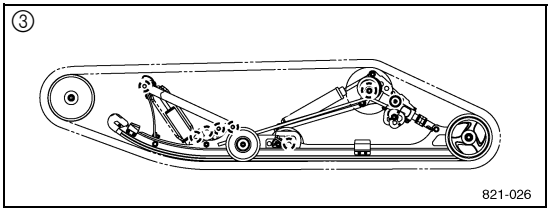

**⚠ WARNING**

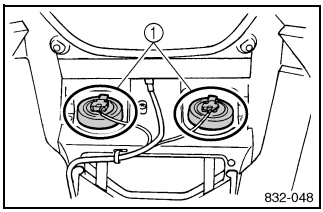
**Apply a dab of grease onto the cable end only. Do not grease the throttle cable because it could become frozen, which could cause loss of control.**

② Front suspension
③ Rear suspension

**⚠ WARNING**

**Be sure to have a Yamaha dealer lubricate the front and rear suspensions.**

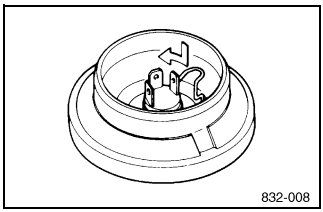





ESU00208

## Headlight bulb replacement

1. Lift up the shroud.
2. Disconnect the headlight connector.
3. Remove the bulb holder cover.
4. Remove the bulb holder by depressing and turning it counterclockwise.

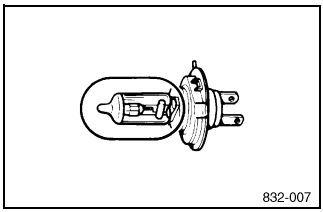



① Bulb holder cover

5. Remove the bulb.

**⚠ WARNING**

**Keep flammable products or your hands away from the hot bulb until it cools down.**

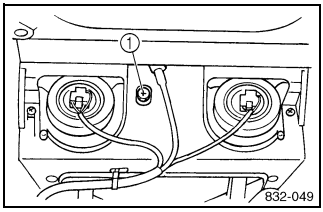



6. Install the new bulb.

Bulb type: 12 V, 60/55 W

**CAUTION:**

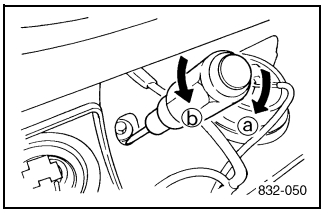
**Keep oil or your hands away from the glass part of the bulb or its life and illumination will be affected.**
**If the glass is oil stained, thoroughly clean it with a cloth moistened with alcohol or lacquer thinner.**




ESU00372

## Headlight beam adjustment

1. Lift up the shroud.
2. Insert a Phillips screwdriver into the hole under the shroud to access the headlight beam adjuster ①.
3. Turn the headlight beam adjuster to adjust the headlight beam.




Headlight beam moves:
ⓐ Down
ⓑ Up

ESU00355

## Battery

This snowmobile is equipped with a sealed-type (MF) battery, which does not require any maintenance. There is no need to check the electrolyte or to add distilled water.

**To charge the battery**

Have a Yamaha dealer charge the battery as soon as possible if it seems to have discharged. Keep in mind that the battery tends to discharge more quickly if the snowmobile is equipped with electrical accessories.

**⚠ WARNING**

**Battery electrolyte is poisonous and dangerous. It contains sulfuric acid and can cause severe burns. Avoid contact with skin, eyes, or clothing.**
**ANTIDOTE:**

- **EXTERNAL: Flush with water.**
- **INTERNAL: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.**
- **EYES: Flush with water for 15 minutes and get prompt medical attention.**

**Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield your eyes when working near batteries.**
**KEEP OUT OF THE REACH OF CHILDREN.**

ESU04231

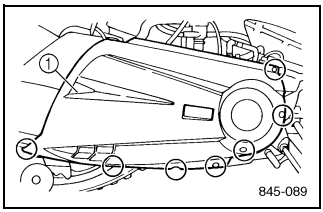
## Fuse replacement

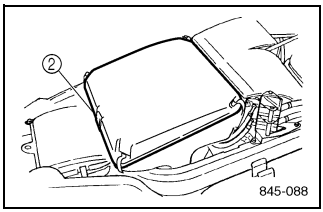
**⚠ WARNING**

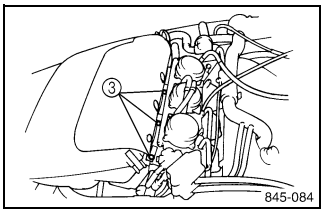
**Be sure to use the specified fuse. A wrong fuse could cause electrical system damage or A FIRE HAZARD.**

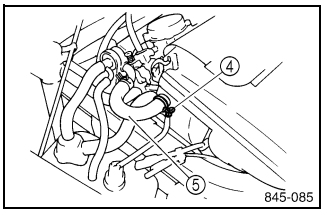
**CAUTION:**

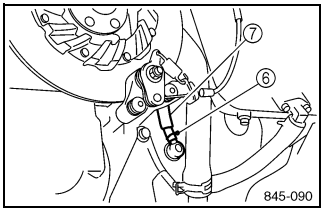
**Be sure to turn the main switch off and disconnect the negative battery lead to prevent accidental short-circuiting.**

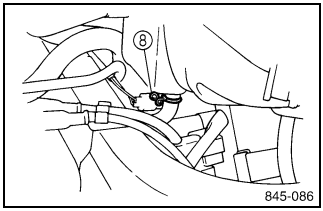



1. Lift up the shroud.
2. Remove the right side cover ①.
3. Unhook the latch ②.
4. Loosen the clamp screws ③.
5. Slide the oil tank breather hose clamp ④ away from the air filter case, and then disconnect the oil tank breather hose ⑤.
6. Slide the crankcase breather hose clamp ⑥ up, and then disconnect the crankcase breather hose ⑦ from the engine.
7. Lift up the air filter case, slide the crankcase breather hose clamp ⑧ down, disconnect the crankcase breather hose from the air filter case, and then remove the air filter case.
8. Disconnect the negative battery lead.
9. Replace the blown fuse with one of the proper amperage.
10. Connect the negative battery lead.
11. Install the air filter case by reversing the removal steps.

**NOTE:**

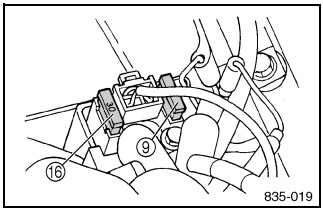
When installing the air filter case, connect the crankcase breather hose to the air filter case first, and then connect it to the engine.

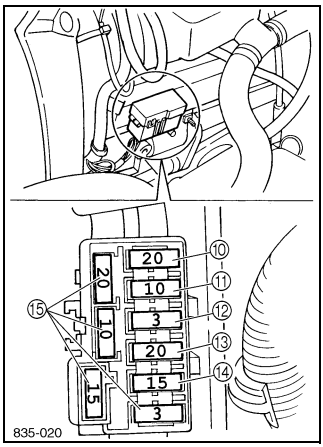
**CAUTION:**

Be sure to connect the breather hoses securely when installing the air filter case.

**NOTE:**

If the fuse immediately blows again, ask a Yamaha dealer to inspect the snowmobile.




| Specified fuses: | |
|---|---|
| ⑨Main fuse: | 30 A |
| ⑩“HEAD” (Headlight) fuse: | 20 A |
| ⑪“SIG” (Signal) fuse: | 10 A |
| ⑫“DC TERM” (Auxiliary DC jack) fuse: | 3 A |
| ⑬“C/W” (Carburetor warmer) fuse: | 20 A |
| ⑭“IGN” (Ignition) fuse: | 15 A |

⑮ Spare fuses (20 A, 10 A, 15 A, 3 A)
⑯ Spare main fuse

ESU04240

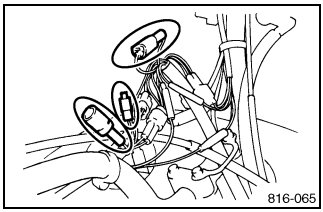
# TROUBLESHOOTING

**A. Engine turns over but does not start**

1. Fuel system
   No fuel supplied to combustion chamber
- No fuel in tank ... Supply fuel.
- Clogged fuel line ... Clean fuel line.
- Clogged carburetor ... Clean carburetor.

   Fuel supplied to combustion chamber
- Flooded engine (too much choke) ... Crank engine with throttle open or wipe the spark plugs dry.

2. Electrical system
   Poor or no spark
- Spark plugs are dirty with carbon or are wet ... Remove carbon or wipe the spark plugs dry; replace if necessary.
- Faulty ignition system ... Ask a Yamaha dealer to inspect.
- T.O.R.S. system malfunction ... Disconnect the throttle switch connectors and connect the wire harness connectors together to bypass the T.O.R.S.




**⚠ WARNING**

- **Before bypassing the T.O.R.S., make sure that the throttle returns properly to the fully closed position.**
- **The T.O.R.S. is an important safety device; in the case of a malfunction, take the snowmobile to a Yamaha dealer immediately for repair.**

3. Compression
   Insufficient
- Loose cylinder head nuts ... Tighten nuts properly.
- Worn or damaged gasket ... Replace gasket.
- Worn or damaged piston and cylinder ... Ask a Yamaha dealer to inspect.

**B. Starting the engine with a discharged battery**

If the snowmobile battery is discharged, the engine can be started using a 12-volt battery and jumper cables. Two connecting leads have been provided for jump-starting the snowmobile. Due to the rubber engine mounting, the snowmobile frame is not a suitable grounding point for jump-starting the engine.

**⚠ WARNING**

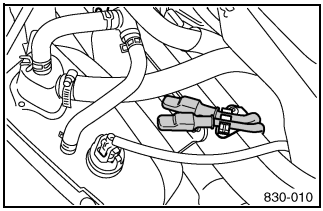
- **Connect the jumper cables only to the connecting lead terminals. Do not connect them to the frame or any wire or other lead.**
- **When connecting the jumper cables, do not contact the jumper cables or connecting lead terminals to each other or to the frame or any metal part of the snowmobile. This can cause electrical system damage or A FIRE HAZARD.**

**CAUTION:**

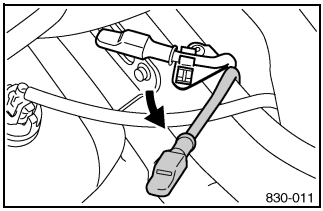
**Use the connecting leads to jump-start the snowmobile only. Do not use the connecting leads for any other purpose.**

1. Apply the parking brake and turn the main switch to “OFF”.

2. Open the shroud.



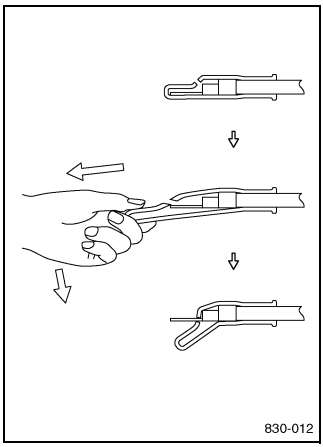

3. Remove the red (+) lead from the lead holder and move it away from the black (-) lead.



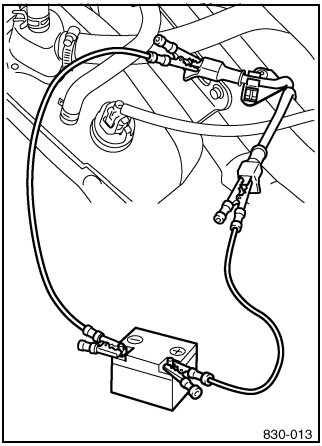

**CAUTION:**

**Be sure to connect the red (+) jumper cable to the red (+) lead and the black (-) jumper cable to the black (-) lead. Do not reverse the connections.**

4. Pull the red (+) lead cover to expose the terminal through the slit in the cover, and then connect the red (+) jumper cable to the red terminal of the discharged battery.




5. Connect the other end of the red (+) jumper cable to the positive (+) terminal of the booster battery.
6. Connect the black (-) jumper cable to the negative (-) terminal of the booster battery.
7. Pull the black (-) lead cover to expose the terminal through the slit in the cover, and then connect the black (-) jumper cable to the black terminal of the discharged battery.




8. Start the engine.
9. Disconnect the black (-) jumper cable from the black (-) connecting lead, and then pull the cover completely over the lead terminal.
10. Disconnect the black (-) jumper cable from the negative (-) terminal of the booster battery.
11. Disconnect the red (+) jumper cable from the positive (+) terminal of the booster battery.
12. Disconnect the red (+) jumper cable from the red (+) connecting lead, and then pull the cover completely over the lead terminal.
13. Install the red (+) lead into the lead holder.

**NOTE:**

Make sure that both the red (+) lead and the black (-) lead are seated securely in the lead holders.

**⚠ WARNING**

**Be sure to pull the lead covers back over the terminals completely. If the terminals are exposed, they could come into contact with the frame or a metal part of the snowmobile and this can cause electrical system damage or A FIRE HAZARD.**

**C. Electric starter does not operate or operates slowly**

1. Engine stop switch is pushed in ... Pull it out.
2. Faulty wire connections ... Check connections or ask a Yamaha dealer to inspect.
3. Discharged battery... Charge battery or see B above.
4. Seized engine ... Seizure is caused by poor lubrication, inadequate fuel, or an air leak—Ask a Yamaha dealer to inspect.
5. "Hydrostatic lock" occurs when fuel has filled the cylinders when the vehicle has been transported. ... Remove the spark plugs and turn the engine over several times with the ignition off to expel excess fuel. Ask a Yamaha dealer to inspect.

**D. Engine power is low**

1. Low coolant temperature indicator light is flashing ... Warm the engine up.
2. Faulty spark plugs ... Clean or replace the spark plugs.
3. Incorrect jetting for altitude or temperature ... Carburetor. Ask a Yamaha dealer to inspect.
4. Improper fuel flow ... See A.1 above.
5. Incorrect V-belt clutch settings for altitude or conditions ... Ask a Yamaha dealer to inspect.

**E. Engine constantly backfires or misfires**

1. Faulty spark plugs ... Replace the spark plugs.
2. Clogged fuel system ... See A.1. above.
3. Malfunctioning T.O.R.S. system ... See A.2. above.

**F. Engine overheats**

1. Insufficient coolant ... Add coolant.
2. Air in cooling system ... Bleed air or ask a Yamaha dealer to inspect.
3. Leaking coolant ... Ask a Yamaha dealer to inspect.

**G. Snowmobile does not move**

1. Malfunctioning V-belt clutch ... Ask a Yamaha dealer to inspect.
2. Drive track does not move ... Foreign object is caught in the drive track, or slide runners have melted to the slide metal due to lack of lubrication.
3. Tight, loose, or broken drive chain ... Ask a Yamaha dealer to inspect.

**H. V-belt twists**

1. Improper V-belt ... Replace with the correct V-belt.
2. Incorrect V-belt clutch offset ... Ask a Yamaha dealer to inspect.
3. Loose or broken engine mount ... Ask a Yamaha dealer to inspect.

**I. V-belt slips or burns**

1. Oily or dirty V-belt or primary and secondary sheave assembly surfaces ... Clean.
2. Problem with the driveline ... See H above.

**J. Engine does not upshift or downshift properly or engages harshly**

1. Worn or damaged V-belt ... Replace the V-belt or ask a Yamaha dealer to inspect.
2. Incorrect V-belt clutch settings for altitude or conditions ... Ask a Yamaha dealer to inspect.
3. Worn or sticking primary sheave assembly ... Ask a Yamaha dealer to inspect.
4. Worn or sticking secondary sheave assembly ... Ask a Yamaha dealer to inspect.

**K. Noise or excessive vibration in drive chain and sprockets**

1. Broken V-belt clutch components ... Ask a Yamaha dealer to inspect.
2. Worn or damaged bearings ... Ask a Yamaha dealer to inspect.
3. Worn or damaged V-belt with flat spots ... Replace.
4. Worn or damaged idler wheels or shafts ... Ask a Yamaha dealer to inspect.
5. Worn or damaged drive track ... Ask a Yamaha dealer to inspect.

ESU03593

# STORAGE

Long-term storage requires some preventive procedures to guard against deterioration.

1. Cleaning

Thoroughly clean the snowmobile, inside and out, to remove the corrosive salts and acids that can accumulate. Use Yamaha Mud, Grease, and Engine Cleaner, or an equivalent product, to loosen mud, grease, and grime. Wash with mild soap, then rinse and dry completely.

2. Lubrication

Lubricate moving parts, suspension linkage, and pivot points. Use the grease or lubricant specified in the MAINTENANCE section, or Yamaha Lube-Zall general-purpose lubricant. Proper lubrication fights corrosion while it reduces friction.

3. Fuel system preparation

Add Yamaha Fuel Stabilizer and Conditioner, or an equivalent stabilizer, to the fuel tank to help prevent fuel oxidation and gum and varnish deposits, and to inhibit corrosion in the fuel system and carburetor. In areas where oxygenated fuel (gasohol) is used, completely drain the fuel system. Ask a Yamaha dealer if further information is needed.

4. Engine

Proper storage of the engine is essential to prevent costly rust and corrosion damage to internal engine components. This is more important in areas where oxygenated fuel (gasohol) is used, because the alcohol content in the fuel increases the chance for water to enter the engine. Use Yamaha Stor-Rite Engine Fogging Oil, or an equivalent fogging oil, to protect both the combustion chamber and crankshaft from corrosion. An alternate method is to remove the carburetor silencer and squirt oil into the carburetor throats while the engine is running.

**CAUTION:**

**Do not attempt to store the snowmobile by simply starting the engine occasionally during the storage period. This can cause more harm than good! Moisture and acids form during combustion which can actually increase the chance for corrosion damage during the storage period.**

5. Protection

Apply a coat of wax to painted surfaces. Apply suitable protectants to the exterior of the engine, drive track, and to other metal, plastic, and rubber parts.

6. Battery

Remove the battery from the snowmobile. Store it in a cool, dry place that is above 0 °C (32 °F), but less than 30 °C (90 °F). Check the condition of the battery once a month, and charge it as necessary.

**⚠ WARNING**

- **Never smoke around the battery while it is being charged. Sparks may ignite the hydrogen gas created by the battery.**
- **Never connect the battery to or disconnect it from the snowmobile while it is being charged. Sparks may ignite the hydrogen gas created by the battery.**
- **Make sure that the battery terminals are tight.**

**CAUTION:**

- **Always keep the battery charged. Storing a discharged battery can cause permanent battery damage.**
- **To charge a sealed-type (MF) battery, a special (constant-voltage) battery charger is required. Using a conventional battery charger will damage the battery. If you do not have access to a sealed-type (MF) battery charger, have a Yamaha dealer charge your battery.**
- **Do not charge the battery quickly. Charge the battery for 10 hours at 1.8 amperes.**

7. Drive track

Loosen the drive track and block up the chassis so that the track is suspended above the ground.

8. V-belt

Remove the V-belt and store separately.

9. Storage

Store the snowmobile in a dry, well-ventilated place out of direct sunlight. Put a fabric cover over the snowmobile, preferably one that is designed for it. Do not use a plastic or vinyl cover—condensation could be trapped underneath which could increase the chances of rusting.

**Returning to service after storage**

When returning your snowmobile to service, install the V-belt and battery and adjust the drive track.

Remove the spark plugs and clean or replace them if necessary. Perform all other pre-operation and seasonal maintenance checks listed in the periodic maintenance chart.

**NOTE:**

Before installing the battery, have a Yamaha dealer inspect and fully charge it.

For peak performance, it is recommended that you have your snowmobile checked and tuned by a Yamaha dealer. The dealer has the experience and training to help you get the maximum performance and use of your Yamaha snowmobile.

ESU00228

# SPECIFICATIONS

ESU00229

## Dimensions

| | RST90 |
|---|---|
| Overall length | 3,135 mm (123.4 in) |
| Overall width | 1,225 mm ( 48.2 in) |
| Overall height | 1,280 mm ( 50.4 in) |
| Dry weight | 272 kg ( 600 lb) |
| Ski stance | 1,086 mm ( 42.8 in) |

ESU00230

## Engine

| | RST90 |
|---|---|
| Type | Liquid cooled 4-stroke, 12 valves |
| Cylinder arrangement | Parallel 3-cylinder |
| Displacement | 973 $cm^3$ |
| Bore × Stroke | 79.0 × 66.2 mm (3.11 × 2.61 in) |
| Idle speed | 1,400 ± 100 r/min |
| Engine oil type | API SE, SF, SG or higher<br>SAE 0W-30 |
| Carburetor type | KEIHIN, CVK40 × 3 |
| Fuel | Unleaded gasoline<br>Pump octane $\frac{R + M}{2}$ ; 88 or higher |
| Starting system | Electric starter |

ESU00231

## Chassis

| | RST90 |
|---|---|
| Drive track and suspension: | |
| Track | Molded rubber, fiber glass rod reinforced |
| Width | 381 mm (15.0 in) |
| Track deflection | 30–35 mm (1.18–1.38 in)/ 100 N (10 kg, 22 lb) |
| Length on ground | 985 mm (38.8 in) |
| Suspension type | Slide Rail Suspension |
| Drive sprocket | Quadruple polyethylene, 9 teeth |
| Transmission: | |
| Type | Automatic centrifugal engagement, infinitely variable 3.8:1–1:1 |
| Sheave distance | Approx. 268.5 mm (10.57 in) |
| Sheave offset | Approx. 15 mm (0.59 in) |
| Engagement speed∗1 | Approx. 3,200 r/min |
| Shift speed∗1 | Approx. 8,500 r/min∗2 |
| Drive chain | Silent chain enclosed in oil bath |
| Reduction ratio | 39/22 (1.77) |
| Fuel tank: | |
| Tank capacity | 38.0 L (8.4 lmp gal, 10.0 US gal) |
| Oil quantity: | |
| With oil filter cartridge replacement | 3.0 L (2.6 lmp qt, 3.2 US qt) |
| Without oil filter cartridge replacement | 2.8 L (2.5 lmp qt, 3.0 US qt) |
| Total amount | 3.7 L (3.3 lmp qt, 3.9 US qt) |
| Brake: | |
| Type | Hydraulic disc type (ventilated disc) |
| Operation | Handle lever, left hand operated |
| Throttle: | |
| Operation | Handle lever, right hand operated |

∗1 Subject to change according to elevation settings.

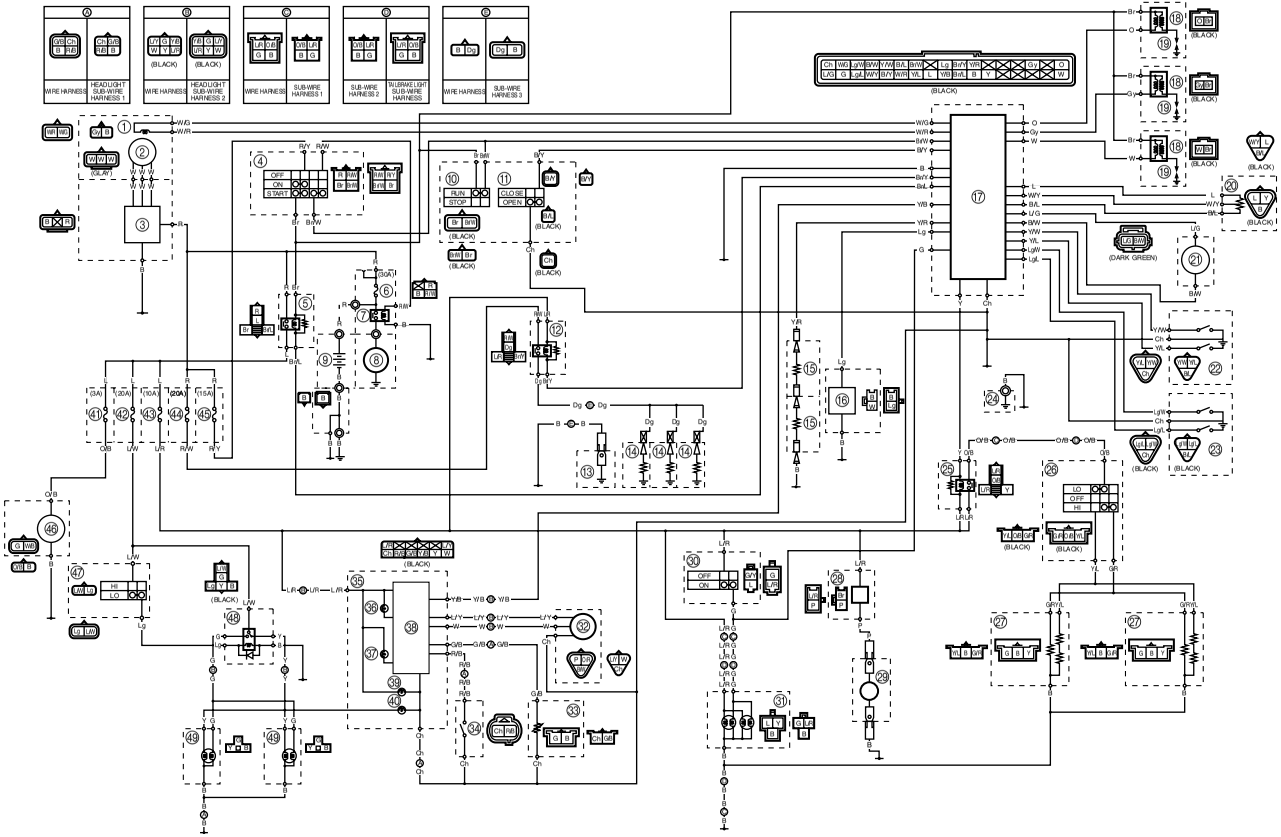
∗2 Usually achieved after approximately 800 m (0.5 mi) traveled.

ESU00232

## Electric

| | | RST90 |
|---|---|---|
| Ignition system | | TCI |
| Spark plug | Type | · R · CR8E (NGK) |
| | Gap | 0.7–0.8 mm (0.028–0.031 in) |
| Battery | Capacity | YTX20L-BS 12 V 18 A·h |
| | Maximum charge rate | 1.8 Amperes/hr for 10 hrs |
| Headlight | Bulb × Quantity | 12 V, 60/55 W × 2 |
| Tail/brake light | Bulb × Quantity | 12 V, 5/21 W × 2 |
| Meter light | Bulb × Quantity | 14 V, 50 mA × 6 |
| Indicator light | Bulb × Quantity | 14 V, 80 mA × 3 |

# WIRING DIAGRAM



① Pickup coil
② A.C. magneto
③ Rectifier/regulator
④ Main switch
⑤ Load control relay
⑥ Main fuse
⑦ Starter relay
⑧ Starter motor
⑨ Battery
⑩ Engine stop switch
⑪ Throttle switch
⑫ Carburetor warmer relay
⑬ Carburetor ground
⑭ Carburetor warmer
⑮ Grip warmer
⑯ Thumb warmer
⑰ C.D.I. unit
⑱ Ignition coil
⑲ Spark plug
⑳ Throttle position sensor
㉑ Coolant temperature sensor
㉒ Grip warmer adjustment switch
㉓ Thumb warmer adjustment switch
㉔ Frame ground
㉕ Passenger grip warmer relay
㉖ Passenger grip warmer switch
㉗ Passenger grip warmer
㉘ DC back buzzer
㉙ Gear position switch
㉚ Brake light switch
㉛ Tail/brake light
㉜ Speed sensor
㉝ Fuel sender
㉞ Oil level switch
㉟ Meter assembly
㊱ Warning light
㊲ Low coolant temperature indicator light
㊳ Multi-function meter
㊴ Meter light
㊵ High beam indicator light
㊶ Auxiliary DC jack fuse
㊷ “HEAD” (Headlight) fuse
㊸ “SIG” (Signal) fuse
㊹ “C/W” (Carburetor warmer) fuse
㊺ “IGN” (Ignition) fuse
㊻ Auxiliary DC jack
㊼ Headlight beam switch
㊽ Headlight relay
㊾ Headlight

**COLOR CODE**

| | |
|---|---|
| B | Black |
| Br | Brown |
| Ch | Chocolate |
| Dg | Dark green |
| G | Green |
| Gy | Gray |
| L | Blue |
| Lg | Light green |
| O | Orange |
| P | Pink |
| R | Red |
| W | White |
| Y | Yellow |
| B/L | Black/Blue |
| B/W | Black/White |
| B/Y | Black/Yellow |
| Br/L | Brown/Blue |
| Br/W | Brown/White |
| Br/Y | Brown/Yellow |
| G/B | Green/Black |
| G/R | Green/Red |
| G/Y | Green/Yellow |
| L/G | Blue/Green |
| L/R | Blue/Red |
| L/W | Blue/White |
| L/Y | Blue/Yellow |
| Lg/L | Light green/Blue |
| Lg/W | Light green/White |
| O/B | Orange/Black |
| O/R | Orange/Red |
| R/B | Red/Black |
| R/W | Red/White |
| R/Y | Red/Yellow |
| W/B | White/Black |
| W/G | White/Green |
| W/R | White/Red |
| W/Y | White/Yellow |
| Y/B | Yellow/Black |
| Y/L | Yellow/Blue |
| Y/R | Yellow/Red |
| Y/W | Yellow/White |

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